1-1-2004

Factors influencing academics' usage of electronic journals

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Copyright Warning

FACTORS INFLUENCING ACADEMICS' USAGE OF ELECTRONIC JOURNALS

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December 2004

USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

Abstract

Through a survey of academics at Edith Cowan University, Australia, this study explored their usage of and attitudes towards academic electronic journals (EJs). The data provided insights into the way academics were using EJs at the time of the study and their thoughts on how they will use them in the future.

The emergence of academics publishing their work in EJs is a fairly recent phenomenon compared to the established tradition of publishing in paper-based journals. Many publishers have also begun to replace paper journals with electronic ones and many librarians have begun incorporating EJs into their resource collections. Librarians need to know their clients' attitudes towards new service delivery mechanisms and/or formats, such as replacing paper-based journals with EJs.

The study's findings supported the earlier work of previous authors, indicating that while some academics were adapting EJs into their work practices, there remained a significant number who were strongly opposed to them. The study drew the following conclusions:

1. At the time of the survey EJs were not wholly accepted by academics;
2. A group of committed enthusiasts existed who advocate EJs;
3. There was almost an equal number of academics who avidly preferred print journals, and were unlikely to change their preferences for the foreseeable future, perhaps for the rest of their career;
4. Most academics were not submitting articles to EJs, although more were open to doing so in the future;
5. Academics believe that publishing in EJs is given lower respect than publishing in paper-based journals;
6. Academics are troubled about historical access to EJ articles;
7. While academics are not using EJs fully they are normally aware of them;

8. Academics appear to have no time to obtain new skills such as using EJs, although there is a willingness to do so;
9. Academics are not inclined to have personal subscriptions to EJs; and
10. A minor number of academics cited EJs in their research however, a larger number thought their usage of them would increase in the future.

Whatever the future of print journals or EJs may be, academic librarians need to continually assess how their clients will be able to gain access to archival information. Short-term access to bundled EJ titles may seem to be a panacea for stagnant or shrinking library budgets unable to keep up with escalating journal costs; however the true cost of abandoning paper journals in favour of EJs needs to be fully considered if the library is unable to maintain the future licensing costs to EJs.

Author Declaration

I certify that this thesis does not, to the best of my knowledge and belief:

i) Incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;

ii) Contain any material previously published or written by another person except where due reference is made in the text; or

iii) Contain any defamatory material.

Acknowledgements

This thesis has benefited greatly from the advice and assistance from many people.

My supervisor, Dr. Karen Anderson, deserves a huge thank you for her encouragement, patience and diligence. This is especially apt as during a large portion of the supervisory process, Karen was completing her PhD.

I gratefully acknowledge the support and assistance of the following people whose support throughout this project has been invaluable: Judy Clayden, Dr Danielle Brady and Dr Gülten Wagner.

Thank you too, to the support staff at Edith Cowan University who helped photocopy and disseminate the survey.

I am also thankful to the academics at Edith Cowan University who participated in this research project and without whose input there would be no thesis!

Lastly, thank you to my family for their love and unwavering support and lastly, but never least, my wonderful husband Dave.

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List of Abbreviations

ARL	Association of Research Libraries
BLEND	Birmingham and Loughborough Electronic Network Development
CORE	*Chemistry Online Retrieval Experiment*
DEST	Department of Education, Science and Training
E-mail	Electronic Mail
ECU	Edith Cowan University
EDU	Educational Development Unit
EIES	Electronic Information Exchange System
EJ	Electronic Journal
eLIB	Electronic Libraries Programme
FTE	Full Time Equivalent
HERDC	Higher Education Research Data Collection
HTML	Hypertext Markup Language
IEEE	Institute of Electrical and Electronics Engineers
IIUM	International Islamic University Malaysia
IPCT-J	*Interpersonal Computing and Technology: An Electronic Journal for the 21st Century*
JISC	Joint Information Systems Committee
MPS	Max Planck Society
MTU	Maritime Transport Unit
PSEL	Policy and Sciences and Economics Library
RAI	Research Activity Index
TOC	Table of Contents
TULIP	The University Licensing Project
URL	Universal Resource Locator
WWW	World Wide Web

FACTORS INFLUENCING ACADEMICS' USAGE OF ELECTRONIC JOURNALS

CHAPTER 1

INTRODUCTION

For centuries academics have published the results of their research and advanced new theories in journals, conference proceedings and books[1]. Over that time paper-based journals have enjoyed the status of being one of the most important avenues for the communication and exchange of ideas and information amongst scholars (Harter & Kim, 1996). Academics are insistent on the importance of journal literature to their work (Olsen 1994, p.1) and while "every scholar reads print journals, not every scholar reads electronic journals" (Harter, 1996), a comment still relevant at the beginning of the 21st Century.

The reasons for academics publishing are many and include:

- Preservation of the results of their work, providing a usable, indexed archive of knowledge;
- Asserting the 'ownership' of ideas and specific results;
- Recognition amongst their peers;
- To exchange information with peers;
- The advancement of their careers (promotion or tenure);
- Legitimising intellectual labour;
- To communicate with colleagues;
- To obtain grant support;
- To reach a large number of people;
- Facilitate learning and discussion; and

- To gain credibility through the peer-review process (Chan, 1996; Ginsparg, 1996; Hunter, 1998; LaPorte, Martler, Akazawa, Sauer, Gamoa, Shenton, Glosser, Villasener & Maclure, c. 1995; Sweeney, 1995; Tomney & Burton, 1998).

Paper-based scholarly journals have formed a critical part of the 'formal' communication process between academics. Articles are usually exposed to critical assessment through the peer-review process before being published. Publication via this procedure give findings contained within the article the stature of being reliable or trustworthy (Olsen, 1994).

The emergence of academics publishing their work in electronic formats, such as academic electronic journals (EJs), is a fairly recent phenomenon compared to the long and established tradition of publishing in paper-based journals. Traditional paper-based journals are facing increasing competition from their electronic competitors. A number of publishers have sought to capture the market by offering journals in both formats, others have completely replaced paper-based versions with electronic ones and a number of new titles are available exclusively through the electronic delivery, while still other publishers offer hybrid versions of both paper and electronic journals.

1.1 Structure of this Report

This report is in seven Chapters.

- Chapter 1 presents the introduction to the study, including the background, purpose, significance and gives the definitions used for the most important concepts;

[1] According to Harter & Kim (1996) the first scholarly journal the *Journal des Scavans,* appeared in 1665, while Olsen (1994 p.1) states the first was the *Philosophical Transactions* of the Royal Society of London, in 1665.

- Chapter 2 provides the literature review in four parts. The parts cover academics' usage of the Internet, general papers on EJs, research studies on EJs and finally papers on EJs and academic tenure;
- Chapter 3 describes Edith Cowan University (ECU), the university focussed on in the study, and details the hypotheses and research questions being investigated;
- Chapter 4 explains the research strategy of the study and discusses the study's validity, reliability, limitations and ethical issues;
- Chapter 5 provides the results, analysis and discussion of the hypotheses proposed in Chapter 3;
- Chapter 6 presents the results, analysis and discussion of the other research questions proposed in Chapter 3; and
- Chapter 7 draws conclusions from the study's results and provides recommendations for future research opportunities.

1.2 Background to the Study

In 1991, the Association of Research Libraries (ARL) began to publish the *Directory of electronic journals, newsletters and academic discussion lists*. The Directory listed only twenty-seven EJs in 1991 (McEldowney, 1996), of which seven were peer-reviewed (Association of Research Libraries, 2000). In 1994, it was estimated that there were slightly more than 400 EJs with seventy-three of those being refereed (Mogge, 1998). By 1996 this had grown to 1,093 EJ titles (McEldowney, 1996), and of those, 417 were peer-reviewed (Association of Research Libraries, 1998). By 1997, 1,465 EJ titles were included, of which 1,049 were peer-reviewed (Association of Research Libraries, 1998 and 2000). In 2000 the *Directory of scholarly electronic journals and academic discussion lists* superceded the previous directory and listed over 3,900 peer-reviewed EJs (Association of Research Libraries, 2000). This directory clearly illustrates the rapid

growth of EJs and peer-reviewed EJs.

With this rapid growth however, other authors note "concerns about the changes that are taking place in the way we are able to disseminate and access information" (Sweeney, 1997). Indeed, the literature reflects disparate opinions from "traditional scholarly journals will likely disappear within 10 to 20 years" (Odlyzko, 1994) and "biomedical journals as we know them will become extinct in the next few years" (La Porte et al. c. 1995). Compare these assertions with the United Kingdom's Follet Report noting that "it is very unlikely that books, periodicals and other traditional media will be superceded in the near future" (cited Ashcroft & Langdon, 1998) and McKnight's declaration that "the paper journal will clearly be with us for many years to come" (1993, p. 9). Valauskas perhaps made the most accurate prediction when he stated "the future will be ... rich in print, electronic, and mixed media for Scholars" (1997)[2].

The continuing crisis of shrinking library budgets and rising journal subscription costs has seen librarians respond in many ways, resulting in articles describing 'battle plans' to cope with this crisis (Dodson & Miller, 1980; Hooper, 1987/88; Sweeney, 1997). As Frazier (1998) stated "between 1986 and 1997 the cost of journal subscriptions jumped by 169 percent ... more than four times the general rate of inflation". Harvard University reported that between 1986 and 2001 its spending on journals rose by 210 percent – more than three times the rate of inflation – while the number of journal subscriptions decreased by 5 percent (*Libraries take a stand*, 2004). Björk (2004) noted that pricing structures for journals was not necessarily related to production costs, but more on each client's capacity and willingness to pay.

Strategies such as cancelling duplicate journal subscriptions, cooperative resource sharing amongst groups of libraries, substituting journals with subscriptions to agencies such as CARL's UNCOVER, and changing information delivery and resource collection policies from 'just-in-case' to 'just-in-time', have all been outlined in the

[2] Clearly, Odlyzko's and La Porte et al.'s predictions can now be viewed as being unrealised and the Follet Report, McKnight and Valauskas being much closer to reality.

library literature (Anand & Malkan, 1982; Dodson & Miller, 1980; Frazier, 1998; Hughes & Lee, 1998; Morris, 1995; Naylor, 1996; Rutstein, DeMiller & Fuseler, 1993; Widdicombe, 1993). In 1992 the ARL surveyed ARL libraries in which 80 percent of respondents indicated that they were moving from an ownership collection model to one that emphasised access (Rutstein, et al., 1993).

More recently, many librarians are turning to a variety of different journal subscription models, including print only, electronic access only and bundling print and electronic titles together where subscription to the print version of a title gives the subscriber access to an electronic version either free or for a slightly higher price (Dixon, 1998). Over the years however, the proportion of paper-based journals to EJs in academic libraries has appeared to have been steadily declining. For example:

- According to Hunter (1998) a major American university library was providing over 25 percent of its journals electronically - more than 7,200 titles, including access to academic peer-reviewed journals and also popular magazines;
- The University of Sydney Library (2003) implemented a policy in 1999 where electronic resources (including EJs) would be purchased in preference to any print equivalent; and
- In 2001, the University of Texas at Austin (2002), subscribed to nearly 50,000 serial titles of which over 26,000 titles were available electronically.

The trend of libraries providing access to more EJs over paper-based copies may not be as established as a cursory review of the literature may indicate. In 2001 (Stevenson, 2001) Edinburgh University cancelled its subscription to electronic versions of Academic Press' titles due to a massive increase in their cost. The University's Library cancelled their access to Academic Press' EJs to take a stand "against inflated price increases which publishers are perpetrating for the electronic versions of their journals" (Stevenson, 2001). Harvard University's library recently also took a similar stand

(*Libraries take a stand*, 2004). Sidney Verba, director of Harvard's University Library stated that Harvard decreased their subscriptions to Elsevier's EJs because of "the need to reassert control over our collections and to encourage new models for research publication" (*Libraries take a stand*, 2004). However, as Garrod (2004) observed, academic libraries are in the main providing 'hybrid services' where electronic and traditional print resources are equally provided to clients.

Despite their long and prestigious history, paper-based journals have drawn criticism. Some of the disadvantages include:

1. High costs that continue to escalate out of proportion with inflation; and
2. The referee process that:
    - Favours authors from prestigious institutions;
    - Favours established authors; and
    - Leads to long delays in the publication process (Harter & Kim, 1996).

The emergence of electronic communication systems such as the Internet has also had a significant impact on the traditional information-seeking habits of library users.

Over the last 25 years, there have been many noteworthy projects conducted researching the opportunities presented by electronic journals (Sullivan, 1997, p. 13). These include the *Electronic Information Exchange System* (EIES), *Birmingham and Loughborough Electronic Network Development Project* (BLEND), *The University Licensing Project* (TULIP), the *SuperJournal Project* and the *Open Journal Project*.

In the late 1970s, EIES had as its main goal the electronic duplication of print journals. It ultimately failed for a number of reasons, with the most important being that it was unable to attract useful articles because potential authors viewed publishing in this format as having no academic prestige (Schauder, 1994, p. 76). Tomney and Burton reinforced the need for EJs to be accepted by academics, stating EJs "will thrive only if

researchers are prepared to have their material published in such a form and to make use of these new publications in their everyday work" (1998, p. 20).

The BLEND project took place from 1980 to 1984. BLEND aimed to assess the feasibility, costs, efficiency, and possible impact of electronic journals and information network systems (Schauder, 1994, p. 76). It also sought to "identify the factors that are necessary for successful electronic journals" (Rowley, 2000). Like EIES, BLEND was not very successful and experienced a number of problems such as poor screens, slow transmission rates, difficult movement through an article, articles were restricted to ASCII text and 'typewriter graphics' and access to suitable terminals was not convenient for many participants (McKnight, 1993, p. 7). BLEND was however, an important step in the development of electronic journals. It must also be remembered that in the 1980s access to electronic networks was not as widespread as in the late 1990s or early 2000s. EIES and BLEND laid a solid foundation for the projects that came after.

The prestigious academic publisher Elsevier Science Inc. began its TULIP pilot project in 1992 (Luthor, 1998) and officially concluded at the end of 1995 (*TULIP: The University Licensing Project,* 1996). TULIP's objective was to research the technical and economic feasibility of electronically distributing journal articles directly to user's workstations via campus networks and the Internet (*TULIP: Final report summary*, 1996). All users could view the abstracts and table of contents (TOCs) of 43 materials science journals. Depending upon the technology available to them at campus level some users could retrieve the full-text of articles. Thirty-eight faculty and graduate students formed the test group. The data collected revealed that though TULIP journals received infrequent usage during the project, users were nonetheless interested in browsing journals electronically. It should also be noted that the journals selected for this trial were not considered "key" titles for materials science researchers. It was also discovered that the familiarity of researchers using the technology was widely divergent (*TULIP: Final report summary*, 1996). Both these factors could have influenced the infrequent usage patterns in the results.

Pullinger (1995) described the *SuperJournal Project*, which was established in 1995 as a part of the Electronic Libraries Programme (eLib). It started in response to the crisis in spiralling journal costs and the opportunities available in the information technology environment. The project sought to discover what factors would make EJs successful, what key features users really wanted in EJs to make them valuable resources and what librarians should seek in their purchase of EJs. The project was conducted at thirteen universities in the United Kingdom and made available forty-eight journal titles with 14,808 articles from 1996 to September 1998 being available. A number of methods were used to conduct the research including:

- Using questionnaires and focus groups to identify what users wanted;
- Monitoring the use of the journals; and
- Asking users about their research activities.

By August 1998 there were 1,817 registered users taking part in the project.

The project discovered that 28 percent of the time the EJs were accessed out of normal office hours. The project also found that the usage of EJs varied markedly amongst the thirteen universities, more than could be explained by different strengths in paper journal holdings, different subjects being taught and so on. In attempting to explain this observation, Pullinger hypothesised that local factors such as how accessible a library was physically, its opening hours, how extensively EJs had been promoted and so on, "play a large part in the use of this e-journal service" (Pullinger, 1995).

The *Open Journal Project* (Hitchcock, Carr, Hall, Harris, Probets, Evans, Brailsford, 1998; *Open Journal Project* 1998a & b) had as its primary goal the provision of a framework for the publication of journals electronically to ensure the maximum access and exposure for these publications. Three other goals included,

1. To include instantaneous access to the electronic versions of existing paper-based journals;

2. To facilitate the use of powerful hypermedia linking techniques; and
3. To support faster access to information, including EJs and other resources located on the Internet (Hitchcock et al. 1998).

While the other projects described above had as their main focus the electronic equivalent of 'paper-based' journals, the *Open Journal Project* takes a step beyond and actively encouraged the extensive use of links. The project managers believed that EJs would evolve beyond what is possible with 'paper journals' to become primarily information and contain many sets of 'links'. The 'links' envisaged by the *Open Journal Project* were much more than single linkages embedded by an author using hypertext markup language (HTML) to other Web pages. They were a superimposed 'Distributed Link Service', where each single 'link' button would be a drop-down menu and point to many other Web documents (Hitchcock, 1996) irrespective of the publisher the reader was accessing. At its conclusion, the project demonstrated the value of citation links and users' preferences for linking, and

> That a collection of information resources, in this case journals but could be other types of resource, available over the web but not necessarily located in the same place or owned by a single source, could be independently joined, or integrated, by the application of hypertext links (*Open Journal Project*, 1998b).

These projects and the factors outlined above have combined to change forever the way information is stored, used and accessed in libraries. Gone are the days when the only way to view a library's catalogue was to physically go to the library. In the early 21st century that catalogue would more than likely be accessible through a web page on the Internet. Gone also are the days when academics needed to be on a routing list to read scholarly journals, subscribe to them personally, or needed to go in person to their library.

Following on from these projects, a number of large, influential publishers and journal aggregators have announced electronic access to their journals. For example:

- In 1995, Elsevier and OCLC announced an alliance regarding the electronic distribution of Elsevier journals. This followed on from Elsevier's TULIP experiment and entailed using OCLC's technical infrastructure to facilitate access to Elsevier journals (*Elsevier science and OCLC to make journals available electronically,* 1995).
- In 1997, John Wiley & Sons instituted Wiley Interscience. This service provided subscription access to most of the company's journals via the Internet (*Electronic access provided to John Wiley journals,* 1997).
- In 1999, EBSCO Information Services released EBSCO Online which linked its indexing and abstracting databases to available full-text articles, giving clients a 'seamless' experience (*EBSCO announces easier access to full text,* 1999).

Against this background there have been abundant articles in the early years of EJs describing their emergence and thoughts on the role they may play in the information seeking and usage habits of academics. However, at that same time there was a lack of research studies investigating this area. Articles from both librarians and academics expressed the personal opinions of the author (Harnard, 1992; 1995a; 1995b; Langston, 1996; LaPorte et al., 1995; Rapple, 1995; Rowland. c.1996). These articles tended to outline the perceived advantages and disadvantages of electronic journals or the author's views on their place in library collections. Numerous reviews of various electronic journals, electronic journal publishers and their browsers have also appeared in the literature (for example Hitchcock, Carr & Hall, 1996; Luthor, 1998).

While a number of research studies investigating EJs exists (Berge & Collins, 1996; Hyldegaard &Seiden, 2004; Olsen, 1992; Schauder, 1994; Stewart, 1996, Tomney & Burton, 1998), there is a need to continually investigate changes in the information

seeking and usage habits of academics, to study different subject groups and to expand the level of knowledge on EJs.

To achieve the above, the results of this study will enable academic librarians to anticipate future demands on their collections from a major user group, and to enable them to make more informed decisions regarding serial collection development policies and budgets. Other groups who will also benefit from the data to be collected in this study include:

- Other information professionals, such as the producers of both paper-based and electronic journals including authors, editors, publishers and subscription agents and document delivery services;
- Learned societies, or other groups, who are already publishing, or might be considering publishing their own electronic journals;
- Other associated industries such as indexing services;
- The information technology departments at medium sized 'western society' universities; and
- ECU's Professional Development Service Centre, who will be able to use the information gathered in this research study to identify groups to target with additional training.

1.3 Purpose of the Study

Stated broadly, the principal focus of this study is to discover the ways and the reasons EJs are used, or not used, by an important client group of academic libraries, namely academics themselves. In doing so, this study will extend the knowledge on academics' use of EJs. The results will provide insights and a clearer understanding of the role EJs are playing in the information seeking and usage habits of academics at medium sized 'western society' universities. The overall intention of this research study is to provide librarians and other information professionals with a framework from which

informed decisions may be made regarding EJs.

The study was propelled by the concern that many librarians are replacing subscriptions to paper-based journals with subscriptions to EJs without giving due consideration to the impact this may have on clients both now and in the future. It has been noted that librarians have "tended to structure their holdings around what they believed was good for their customers" (Dickstein & Mills, 2000) without giving full consideration to the effect this may have on users. As Dickstein and Mills (2000) have succinctly written, it epitomises the 'librarian knows best' attitude.

Through a survey of academics at ECU, this study will explore the perceptions and elicit the views and attitudes of ECU academics towards EJs. The data will provide insights into the way academics are using EJs at the time of the study and their thoughts on how they will use them in the future.

The purpose of both traditional paper-based journals and EJs is to facilitate the reasons academics publish, as listed above. If this is accepted as a given, then librarians must strive to understand if EJs are of lesser, equal or superior benefit to their users.

Librarians should not heedlessly stay at the forefront of indiscriminately implementing new technology offered to the information profession. Rather, they need to understand how new technologies affect the usability or acceptability of the information, from the clients' perspective and whether or not the innovation provides an actual improvement in the services being offered. This, of course, must not just be judged from the librarian's perspective. Librarians also need to know their client's attitudes towards new service delivery mechanisms and/or formats, such as replacing paper-based journals with electronic versions.

Once these issues are properly understood, the information professional is then equipped to make informed decisions regarding the suitability of including new formats into their institution's regular collection.

Results of this survey will enable academic librarians to make more informed decisions regarding EJs, such as whether or not to include electronic journals in library collections, or to cancel paper-based journals in favour of their virtual equivalents. Academic librarians will be in a better position to judge the impact of changing from paper-based journals to electronic editions on a major user group. Academic librarians will also have more concrete information drawn from research on which to base their decisions when deciding the future direction of serial collection policies and budgets.

1.4 Significance of the Study

At the time the study was proposed, there had been little research conducted examining how academics used EJs in their professional life. During the course of the study this situation has changed and a number of research endeavours have focused on analysing various aspects of the relationship between academics and EJs (Berge & Collins, 1996; Fossmire & Yu, 2000; Harter, 1996; Harter & Kim, 1996; Olsen, 1994; Pullinger, 1999; Schauder, 1994; Stewart, 1996). However, given the rapidly increasing number of EJs available to academics, it is critical for information professionals to continuously observe and assess the usefulness of EJs to academics.

Many studies have noted that journal literature is one of the most important and frequently used sources that academics use when keeping current with their subject areas, when beginning background research on a new topic, or in communicating with each other. Journal literature is considered by many academics to be integral to their scholarly work (Olsen, 1994, p. 8). As Olsen has noted, "publishers are beginning to replace the paper medium by the electronic presentation of journals" (1994, p. 2). With this in mind, it is imperative for academic librarians to be able to anticipate how this shift will affect a major group[3] of information users. The issues and questions facing library professionals

[3] Franklin & Plum's (2004) survey of more than 18,000 United States academic library users showed that nearly 57% of all library users, from both physically inside and outside the library, came from a single user group – Faculty, staff and research fellows.

include:

- Should the library profession wholeheartedly embrace EJs?
- If available, should librarians offer their users choices in media types available for usage (such as holding paper copies and EJs in the same title)?
- Should librarians continue their role of storing and providing access to paper copies of journals, or disband that role in favour of electronic access?
- Will the emergence of EJs lead to a class of researchers who have access to a much wider range of resource material because they are technologically more adept than others; Have more sophisticated browsers; Or have access to more current software and hardware?
- What problems can be anticipated in archiving or preserving EJs?
- How will future technological developments impact access to and storage of EJs?
- Will the costs of accessing EJs remain constant or increase exponentially as more and more libraries and users commit to them?

These are important questions that need to be fully answered before academic librarians irrevocably commit themselves to any course of action (such as cancelling paper subscriptions in favour of giving access to EJs) that could have significant or unexpected ramifications for the future. Given the exponentially increasing amount of information continuously being published to the World Wide Web (WWW), and the growing usage academics are making use of the Internet (Applebee, Clayton & Pascoe, 1977; Bane & Milheim, 1995; Clayton, 1999; Majid & Abazova, 1999), it is critical for information professionals to continually monitor and assess academics' attitudes towards and uptake of EJs.

This study does not attempt to answer all the questions outlined above.

However it will provide a snapshot describing how academics at one Australian university in 1999 to 2000 both view and use EJs. The research will contribute, in a substantial way, to the understanding of academics' usage and attitudes towards EJs.

Clayton (1999) observed that Australia's universities were representative "of most universities around the world" in regards to the uptake and usage of the Internet by academics. It has also been stated that Australia's government-funded universities, of which ECU is one, have established reputations for world-class quality education (*Universities in Australia*, c.2004). *Universities in Australia*, (c.2004) noted that Australian universities are controlled by State and Commonwealth legislation to receive accreditation and to set standards. These observations lend support to the generalisability of this study. However, it should be noted that it is the reader that will be in the best situation to judge the validity of generalising this study's results to their own context.

The study will also present a range of research and opinions on EJs and by doing so, endeavours to equip information professionals to:

1. Understand the general advantages and disadvantages of EJs;
2. Understand the advantages and disadvantages of EJs *from the clients' perspective*;
3. Understand the impact of changing established research habits *without properly equipping or training clients in the necessary skills;* and
4. To bring together, in one body of work, a range of opinions and research to enable academic librarians to make informed opinions regarding the role of EJs, rather than adopting them solely as a solution to budgetary pressures.

1.5 Definitions

1.5.1 Academic Journals

Edwards (1997) defined 'academic journals' as those published, or originating with, reputable publishers such as Elsevier or learned societies and "containing scholarly, peer-reviewed articles, rather than the newsletter type of publication". It is noted that Edwards' definition hinges on two elements,

1. The publisher *responsible* for the journals publication; and
2. The content of the journal which must be *scholarly* peer-reviewed articles.

Schauder (1994) used quite different terms. He defined a *professional article* as being a short publication, which deals with a specific topic, in pure or applied learning or research. Schauder then defined a *journal*, as being a "printed serial publication whose contents include selected professional articles in a particular field or discipline... the purpose of journals is both to disseminate current knowledge and to place on record contributions to knowledge" (1994, p. 74).

Schauder's 'journal' definition can thus be seen to be quite different to that of Edwards. Schauder's definition hinges on the *role* of academic journals, which is to *disseminate* and *record knowledge.*

Waddell (1993, p. 248) has given a clear and concise definition for journals as being "any collection of learned articles that have been accepted via the peer review process for publication as part of a series". Waddell enlarged her definition to include the *functions* of journals being:

1. To inform students and researchers of research results and scholarship;
2. To be used as a means of assessing scholars, whether for funding or career advancement; and
3. A refereed archive of past scholarship.

Fossmire and Yu (2000) offered a simple definition of academic journals as being those that are peer-reviewed and containing articles with references. Fossmire and Yu's emphasis on the peer-review process is similar to Waddell's but in contrast to the prominence Schauder gave to 'professional articles'.

However, in contrast to Waddell and Fossmire and Yu, Treloar included both refereed and non-refereed publications in his definition and instead focussed on the *author-audience* aspect. As such, he defined academic journals as being by 'specialists' for other 'specialists'.

Utilising elements of and enlarging these definitions, this study defines 'academic journals' as being serial publications containing:

1. Refereed or non refereed articles;
2. Articles that contribute to the body of knowledge of a particular field or discipline; and
3. Journals whose primary readership is drawn from institutions of higher learning, professional associations or Research and Development departments of governments or private businesses.

1.5.2 Paper-Based Journals.

Basically self-defined, 'paper-based' journals are serial publications with the features listed above but are *printed on paper*. Fussler and Simon characterised paper-based journals as being "a related sequence of publications issued at regular or irregular intervals, with some scheme of consecutive numbering and intended to be continued indefinitely, containing work by several writers" (cited Valauskas, 1997).

1.5.3 Electronic Journals.

McMillan outlined the characteristics of EJs as being "any serials produced, published and distributed nationally and internationally via electronic networks such as

... the Internet" (cited Collins & Berge, 1994, p. 772).

Waddell's definition is similar to McMillan's and includes any journal where the "full end product is available electronically" (1993, p. 249). This of course would include journals available through the Internet, on CD-ROM or even on diskettes. At the time Waddell wrote his article however, many electronic journals did not include illustrations, graphics, advertisements, letter pages etc, which would have been included in a paper version.

Harrison and Steven offered another definition for 'electronic scholarly journals' as being "academic serials that are delivered through the Internet and its associated technologies" (1995, p. 593). The same theme can be found in the definition provided by Tomney and Burton, who stated that EJs

- Publish original scholarly articles;
- Contain peer-reviewed or edited articles; and
- Are available in, however not solely, electronic format (1998, p. 420).

Fossmire & Yu (2000) stated that electronic journals might also include those with print counterparts. For Fossmire & Yu to consider a journal to be 'electronic' it must contain "at least as much content as the print counterpart and is published approximately simultaneously with the print version".

Edwards' (1997) definition for 'electronic journals' stated that an 'electronic journal' was one where articles were not delivered as print on paper, but where text is read on, and/or printed from, the end-user's computer. This definition would also include journals available on CD-ROM or diskettes.

Langschied differed from these authors, and argued there was a difference between 'online' and 'electronic' journals (cited Collins & Berge, 1994, p. 772). Langschied considered 'online journals' to be paper-based journals merely with an

electronic copy available. Journals such as *The Harvard Business Review*, available both as a print journal and electronically through DIALOG, are an example of Langschied's 'online journal'. True 'electronic journals', Langschied asserted, are ones where there are no paper-based copies produced by the publisher.

Rupp-Serrano's (1995) and Rathie's (cited Sweeney, 1997) definitions for an 'electronic periodical' have a similar theme to Edwards and Langschied and are focussed on the totally end-to-end electronic nature of EJs.

> The electronic periodical may be defined as a publication which is not on paper, but is rather created and stored by electronic means. That is, the electronic periodical is written, edited, refereed, and distributed by means of machine-readable files which are distributed via a telecommunications system. (Rupp-Serrano, 1995, p.1)

with the proliferation of personal computers, most articles are now written by academics in machine-readable format on their own desktop computer. Indeed, almost all publishers edit and produce their journals from machine-readable files. with that understood the one common thread through the definitions given above is the *method* of distribution being the defining element separating 'paper-based' and 'electronic' journals.

The focus of this study is on 'electronic journals', defined as being the same as or similar in nature to paper-based journals. Both forms are serials that contain articles. However, 'electronic journals' are defined as those that are delivered *exclusively* to subscribers through an online electronic medium, such as the Internet. This definition excludes journals available on CD-ROM or diskette but not available through an online electronic medium, but includes journals available in both paper-based and online electronic formats.

Edwards (1997) noted that electronic journals exist along a continuum from:

1. Titles providing an electronic TOC with articles only in print format;
2. Those with electronic TOCs and abstracts and with articles only in print format;
3. Those with electronic full-text articles but excluding letters and reviews;
4. The complete full-text electronic equivalent of print journals with a print counterpart.

This study excludes all journals that do not contain the full text of articles in electronic format. Journals that give TOCs as well as making available the full-text of articles through a web site are included. However, the frequency of publication is not a concern.

The following definition of 'electronic journals' was provided to survey participants to ensure consistent responses to the research questions:

> 'Electronic journals' are similar in nature to 'paper-based' journals and may contain features paper journals are not able to (such as hyper-text links, video, etc), but are **exclusively** delivered to you through an electronic medium, such as the Internet. Electronic versions of *The Harvard Business Review* or *New Scientist* etc are examples. NB: journals available as both electronic and paper versions are included in this definition.

It is also noted that 'electronic journal' articles have, and will continue to develop features beyond the capabilities of paper-based journals. These include incorporation of video images, hypertext linkages within articles, and so on. Sundaram has argued that the h-journal differs from the

> Print journal model of document organisation, while

> attempting to retain most of its functionality and adding its own. It utilizes hypertext and the capabilities of the electronic medium to deliver a hyper document that supports differing reading behaviours and users and information retrieval by both browsing and known item searching. It includes other document formats (graphics and video) besides text, [and] supports different types of user interactactivity (cited Monty, 1996).

However, this study considers these as being *features* and are not necessary to the overall definition of 'electronic journals'.

CHAPTER 2

LITERATURE REVIEW

The main purpose of this literature review is to identify the development of theories regarding EJs and assess the extent of current knowledge on EJs.

The literature review concentrated on a number of distinct tracks of investigation. The first section presents an overview of articles that have been written about academics' use of the Internet. The second section summarises articles that are usually general in nature and frequently express the personal opinions or theories of the author regarding academics and EJs. The third section outlines research that has taken place on this topic. The fourth section covers electronic journals and their relationship with tenure.

A variety of methods was utilised in reviewing the literature, including:

- Searching through a number of library catalogues;
- Keyword searches using citation databases and CD ROMs, and full-text online journals;
- Internet search engines;
- Broader trawls through the Internet, including reviewing renowned academics' sites; and
- Citation analysis.

From this a variety of literature sources were reviewed including books, paper-based and EJ articles, conference papers and theses.

2.1 Academics' Usage of the Internet

The literature covering academics' use of the Internet was investigated, as their level of familiarity with the Internet was considered a factor that may affect their usage and attitudes towards EJs, and as such was worthy of exploration.

Bane and Milheim (1995) conducted an electronic survey in 1995 by sending a questionnaire to 143 randomly chosen scholarly electronic discussion groups[4]. A total of 1,536 surveys were completed and returned to the authors. Their results showed that nearly 90 percent of respondents utilised personal e-mail more than once a week via the Internet. The authors concluded that at the time of their survey the Internet was being primarily being used for communication amongst fellow academics, or accessing discussion groups, using e-mail.

Applebee, Clayton and Pascoe (1997) conducted a survey in 1995 surveying the academic staff at the University of Canberra, Australia. The main objective of their study was to discover "what proportion of academics were actually making use of the Internet, in what ways they were making use of it and how often they were using it". The study was conducted in four parts:

1. Two focus groups were held with responses from these focus groups used to formulate the initial survey questions.
2. A dozen academic staff were then used for a pilot survey using either a paper-based survey or an e-mail survey.
3. An e-mail survey was sent to all 324 academic staff at the University. A follow-up e-mail was then issued to non-respondents. In total, 143 e-mail responses were received.
4. A paper-based survey was then used to capture the final non-respondents. Non-respondents to the initial paper survey were sent a follow-up copy. In total, 100 paper responses were received.

At the conclusion of the study 243 responses were received out of a total population of 324, or 75 percent of the population and was representative of the university's academic population.

The study tested a number of hypotheses using a series of chi-square tests to assess if the results were statistically significant. The following results were reported:

1. Differences by faculty;
   The study found that usage of the Internet differed according to faculty, with the Faculty of Information Sciences and Engineering being the most frequent users of e-mail and the Internet.
2. Gender;
   The study found there were differences in usage of e-mail and the Internet according to differences in gender, with males being heavier users.
3. Age;
   The study anticipated that age may be a factor in academics' willingness to utilise e-mail and the Internet, with younger academics being more willing to use it than their older colleagues. While the study reported that this did not appear to be supported by their results, the authors recognised that their population had a pronounced bias towards respondents in their 40s.

Clayton (1999) spoke further on this study and noted that over 80 percent of respondents reported that they did not have sufficient time to "use all the information that they gathered via the Internet", and over 91 percent responded that they were not able to adequately investigate what information might be obtainable via the Internet.

The study also showed that academics used the Internet infrequently for teaching purposes and that time was a "major barrier to increased or more effective utilization of the network" (Clayton, 1999). Most academic staff reported a need for

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[4] sometimes referred to as listservs

training in using e-mail and the Internet.

Clayton, (1999) also spoke, at a National Scholarly Communications Forum, about the results of an extension of the first study where he stated that in broad terms while the Internet offered academics exciting opportunities most academics "aren't there yet - indeed, some of them aren't even on the threshold". While he acknowledged some academics were adept, he stressed that the majority hardly used Internet tools.

As a follow-up to the smaller study, in 1997 Clayton and his colleagues Applebee, Pascoe, Sharpe and Bruce carried out a stratified random sample of Internet use by academics in Australia (Clayton, 1999). The survey received 539 responses, a 51.3 percent response rate, with respondents fairly evenly drawn across all universities in Australia.

The results included:

- More than 95 percent of the academics had access to a personal computer in their office, which was connected to the Internet;
- More than 55 percent of the academics self-reported that their skills in using the Internet were 'competent' and more than 10 percent considered themselves to be 'expert'. Whereas just over 20 percent considered themselves to be at a 'beginner' level and just over 5 percent were non-users;
- 28 percent of respondents used the Internet at least daily, 39 percent at least weekly, 25.9 percent less than once each week and 7.1 percent claimed they never used it; and
- 38.3 percent of respondents used online databases and data archives less than once a week and 28.3 percent stated they never used them.

This study discovered that the two underlying causes for academics not using the Internet or e-mail were:

1. The lack of training; and
2. The lack of time for learning the necessary skills.

The results of this study supported the smaller survey carried out by Applebee, Clayton and Pascoe (1997) on academic staff at the University of Canberra.

Tomney and Burton's (1998) survey of academics' usage and attitudes towards EJs also support the two studies above. As Tomney and Burton discovered, one of the main reasons academics did not use EJs was due to "a lack of time, both to search for journals and to familiarise themselves with computer technology" (1998, p. 425).

Clayton (1999) also expounded the view that the results of the study on Internet usage by academics in Australia indicated that the majority of academics asked colleagues or friends for assistance, and pursued self-instruction as their main source for learning the necessary skills to use the Internet effectively. This, Clayton believed, meant that the traditional 'trainer-trainee' relationship many academic librarians adopt when exposing users to new skills needed to be challenged.

The disparate results between Bane and Milheim's (1995) study which noted that 90 percent of respondents used personal e-mail at least weekly while Clayton (1999) noted that only 67 percent of their sample used the Internet at least weekly should be noted. One possible explanation for this is that Bane and Milheim restricted their sample to users of electronic discussion lists, which it could be reasonably assumed, biased their results towards a computer-literate sample. Clayton's survey included 7.1 percent of respondents who had never used the Internet and 25.9 percent who stated they used the Internet less than once each week.

Majid and Abazova (1999) reported on a survey of 180 academics at the International Islamic University Malaysia (IIUM). Of the 114 respondents, 80 (70.2 percent) were male and 34 (29.8 percent) were female. Fourteen respondents (12.4 percent) were professors, 12 (11.4 percent) associate professors, 41 (35.9 percent)

assistant professors, and 46 (40.4 percent) lecturers. IIUM's library provided access to an assortment of electronic information sources and services including CD-ROM, a number of local newspapers, in-house databases and an Online Public Access Catalogue. A number of the library's computers also provided access to the Internet. Results from this study included:

- 62 (64.4 percent) of respondents reported using the Internet;
- Respondents who reported using the Internet comprised 23 female (67 percent of the female respondents) and 39 male (48.7 percent of the male respondents);
- The majority of respondents using the Internet, used it primarily to access e-mail;
- When the relationship between the age of respondents and their usage of the Internet was examined using chi-square, no significant difference was discovered; and
- Respondents who had not been accessing the Internet primarily stated this was due to their unfamiliarity with searching techniques.

The results of Majid and Abazova's study supports Applebee et al.'s (1997) findings that there was no statistical significant difference in the age of academics and their usage of the Internet. Majid and Abazova's study also supported the studies outlined in this section and highlights the main reason academics were not using the Internet was due to a lack of training or their unfamiliarity with searching techniques.

2.2 Electronic Journals: General

Amiran, Orr and Unsworth (1991) outlined the possibilities offered by, and described the state of, electronic publishing in the humanities in the early 1990s. At that

time only a small number of EJs were being marketed, but the authors recognised that new titles were continuously appearing and felt that this trend was likely to continue (1991, p. 73). Amiran et al. were the editors, and responsible for the publication of the EJ *Postmodern Culture*, whose first issue appeared in September 1990[5]. The journal was a peer-reviewed publication that focussed on contemporary literature, theory and culture, and also contained a selection of fiction, poetry, and works in progress.

In establishing this electronic journal, Amiran et al. considered which aspects of paper-based journals could effectively be transported to an electronic medium, and which parts could be rejected. It was decided to publish the journal in 'issues' and for submissions to go through a rigorous peer-review system, similar to academic paper-based journals. However, utilising the power of the electronic medium Amiran et al. established an associated online discussion group to add an instant interactive dimension to the journal. The journal also published works-in-progress to allow discussion between scholars and readers, to encourage a work to evolve and to allow authors to respond to feedback before a work was 'finished'.

Hitchcock, Carr, and Hall's 1995 survey of science, technology, and medicine peer-reviewed full-text EJs discovered over 100 titles with hundreds more becoming electronically available by 1996. Their review also highlighted the fact that many EJs were merely "electronic editions of paper journals" (1998). Stevan Harnard, one of the most prolific and widely cited authors in this area, argued strongly in his "subversive proposal" that all works by scholars and academics should be made *freely* available to all through electronic publication (Harnard, 1995a and 1995b). By doing so, Harnard pushed the boundary of electronic publications and EJs well beyond what Hitchcock et al.'s survey discovered. Harnard's "subversive proposal" and strong support for academics publishing in EJs has had a major impact on the literature and he has been frequently cited in the literature.

[5] *Postmodern Culture* continues to be published and is available from John Hopkins University Press (PMC 2000)

Harnard (1992) believed that electronic publications go much further than being simply a more efficient method of publishing and argued strongly that the possibility of *interactiveness,* between author and reader, is the electronic medium's greatest strength.

Outlining the perceived advantages and disadvantages of EJs has been a constant theme at the heart of many articles published the subject.

The advantages of EJs frequently outlined in the literature include:

1. A higher rate of acceptance for articles;
2. Access is generally easier given a majority of academics have Internet access via their desktop personal computers;
3. Peer review and publication of submitted articles was much faster than paper-based journals;
4. Interaction between authors and readers may be possible due to the speed of communication offered by the medium;
5. Networked communications may make collaboration between widely separated authors easier and faster;
6. Users may find it easier to subscribe to EJs, making them more widely available;
7. Many journal aggregators offer clients usage reports that show which EJs have been accessed and other useful statistics that enable library managers to make collection development decisions;
8. The page limitations of paper-based journals need not be a constraint;
9. Authors may have the capability to publish "all the data on which research is based" (Chan, 1996);
10. The storage of electronic journals requires little space and may help overcome the storage space problems being experienced by large research libraries;

11. The frequency of publication could be more variable than with paper-based journals;
12. EJ publishers may offer personalised access such as customising the user interface or offering tailored services based on a client's needs, interests or preferences;
13. Electronic journals offer the possibility of incorporating video, audio, animated graphics, hyper-text linkages, and colour images can easily be included, something usually limited to a few, paper-based journals;
14. Electronic journals may solve the problem of the chemical break-down of paper-based journals;
15. Large amounts of electronic text can be searched in intricate ways that would be impossible to do manually with paper-based text. Usually searching capabilities include:
    - Boolean operators (and, Or, and Not);
    - Left, right and/or internal truncation, and phrase searching;
    - The ability to specify which fields to search; or
    - Limiting searches to specific dates, languages or journals;
16. Academics in 'less-developed' nations would have easy access to free EJs;
17. EJs will save large quantities of paper; and
18. Academics are freed from only accessing journals at the office or the library and can access the literature at their own convenience (Chan, 1996; Collins & Berge, 1994; Edwards, 1997; Hitchcock et al., 1996; *I also froth*, 2004; Hyldegaard & Seiden, 2004; Langston, 1996; McKay, 1999; Meadows, 1997; Olsen, 1994; Rapple, 1995; Rivas-Rodriguez, 1997; Rupp-Serrano, 1995; Rusch-Feja & Siebeky, 1999; Treloar, 1995; Woodward, Rowland, McKnight, Meadows, & Pritchett, 1997).

The disadvantages of electronic journals have also been outlined in the literature, and include:

1. A lack of security;
2. Authors are wary of the ephemeral nature of electronic archives and documents. As some web sites are de-commissioned or re-organised or publications are withdrawn from the WWW, the Universal Resource Locators (URLs) given in bibliographies to EJs may not work. Academics are most familiar with journal articles remaining static, and once published "they become fixed in time and part of the historical record of scholarship" (Treloar, 1995). However, electronic documents can change rapidly and updated editions may not be easily recognisable from original or previous versions;
3. Some users' e-mail accounts do not have the capacity to receive large documents;
4. Sophisticated browsing of articles is not always possible;
5. Academics are wary of publishing in electronic journals until they can be assured of their prestige and place in winning tenure, promotion or funding;
6. Many potential users may not know how to locate and read articles;
7. Reading text on a screen is slower and more fatiguing than reading paper-based text;
8. Increased capacity for plagiarism or loss of copyright control;
9. Journal publishers or aggregators tend to develop their own branding and specific interfaces, many of which are not user friendly;
10. Users often need to access journals in a variety of locations, not only when computer access is available;
11. EJs are less portable than paper journal (unless EJ articles are printed out);
12. Absence of back issues (for some EJs);
13. The need to learn multiple systems, logons and passwords to access different commercial EJ suppliers;
14. Electronic journals may favour technology-rich nations and penalize academics without access to the necessary hardware and software, as "it is

difficult to read electronic journals if there is no access to a computer" (Rapple, 1995, p. 32); and

15. Not all electronic journals are indexed or abstracted and so tracking down or discovering useful material can be difficult (Collins & Berge, 1994; Harrison & MacLeod, 2003; Hitchcock et al., 1996; *I also froth*, 2004; Luther, 1998; McKay, 1999; Meadows, 1997; Okerson, 1992; Olsen, 1994; Rivas-Rodriguez, 1997; Rupp-Serrano, 1995; Rusch-Feja & Siebeky, 1999; Speir, Palmer, Wren & Hahn, 1998; Treloar, 1995).

Expanding on disadvantage one listed above, a number of authors have been concerned about the lack of security protecting articles in EJs from being altered after posting to the Internet. Lancaster's (1995) study of academic administrators and university library directors found that respondents were fairly neutral regarding the 'dangers' associated with electronic publishing - such as the 'integrity' of articles (i.e. that an author's work could be altered once published on the Internet). Rowland (c. 1996) stated that articles once published or made available through the Internet must be 'fixed' and unalterable by anyone else. An Internet hacker in 2001 easily inserted phoney quotes and misinformation in a number of Yahoo! Newspages with the intention of highlighting the vulnerability of information found through the Internet (Bergstein, 2001). However, this remains an issue that has largely been ignored by academics.

Expanding on disadvantage seven listed above, Valauskas (1997) outlined in detail why reading from computer screens is a different experience to reading on paper. His differences included:

- Any given area on a monitor holds up to 50 times less information than the equivalent space on paper;
- 40 percent of information on a monitor is lost due to screen flicker and other factors. For above average readers, this information loss is greater;
- On average, most people read up to 25 to 30 percent more slowly from a monitor; and

- Most readers will not read lengthy text from a monitor. Valauskas cited one study on the uses of 19,000 pages of electronic text which suggested that users would only scan limited amounts of electronic text.

Meadows (1997) hypothesised the acceptance of EJs amongst academics would follow an S-shaped curve. In the 'early days' of EJs there was little acceptance of EJs, which formed the "bottom part of the S" curve (Meadows, 1997). The central part of the 'S' represents the time when EJs began to gain wider acceptance. The top of the 'S' curve represents the time where "most of the community concerned accept the innovation, so the rate slows down as saturation is reached" (Meadows, 1997). Meadows stated that at the time of writing his article EJs were entering the central part of the 'S' curve when they would begin gaining wider acceptance.

Meadows' hypothesis, while interesting, is not necessarily supported through case studies such as at the Sterling C. Evans Library at Texas A&M University, where librarians hypothesised that "patrons would like the ability to have electronic access to serials either from their desktop or from a convenient location" (Tenner et al., 1998). This assumption was tested when the new Policy and Sciences and Economics Library branch (PSEL) of the Sterling C. Evans Library's journal collection was established. No additional library funding was provided to establish PSEL's collection which led the planning group to decide to rely on electronic formats wherever possible. It became apparent however that "the faculty ... clearly preferred print issues of the journals over the electronic version" (Tenner et al. 1998). Faculty expressed concerns over such issues as the availability, reliability and archivability of EJs. Faculty also considered important access to advertisements and book reviews that did not come with their EJs. The tension between the librarians' desire to provide access to EJs and what their clients actually wanted was clearly demonstrated in Tenner et al's. article. In their conclusion, the authors stated PSEL's librarians has dedicated themselves "to making available campus-wide whatever electronic products [they] can" (Tenner eta al., 1998). This clearly conflicted with what PSEL's clients clearly preferred and Meadows' (1997) hypothesis.

A different opinion is offered by Peek who stated that "thanks to the entry of the major players, electronically published scholarly journals are truly legitimate and are the first place many scholars go" (2001).

Peek's, Tenner et al.'s and Meadows' articles clearly demonstrate how there is at times conflicting debate in the literature regarding how acceptable academics find EJs. However, with the entry of major publishing houses in to the EJ arena, as noted by Peek, it could be reasonably assumed that academics' usage of EJs may have changed since Tenner et al. recorded their observations.

Meadows (1997) also highlighted how a great deal of the printing process is electronic, even for paper-based journals. Publishers require authors to contribute articles in electronic format. *The Australian Library Journal* advises authors to submit articles on disk as it makes "the editor's and typesetters tasks easier" (Australian Library and Information Association, 2001). As Dixon (1998) stated, many librarians believe that EJs should be less expensive than paper-based journals. However, this ignores the "constant enhancement, attention, and care" (Dixon, 1998) and the cost of the hardware, software, communication and personnel costs that EJs require. Fisher compared the costs of producing both electronic and print journals and found that the "direct costs of publishing an electronic journal are substantially below that of a print journal ... the overhead costs, however, are much higher" (1997).

In pondering the likely future and acceptance of EJs, Meadows (1997) posed the following questions:

- Where will EJs be stored?
- Who will pay for the costs of transferring EJs from one format or software as it becomes outdated? and
- When publishers are bought-out by competitors, will the new owners honour past access agreements, or seek to modify them?

These remain concerns.

2.3 Electronic Journals: Research Studies

Academics' usage of EJs has received some attention from researchers and the following section presents a selection of noteworthy investigations.

Olsen (1994) presented the results of interviews with 46 scholars (16 from Chemistry, 16 from Sociology and 14 from English departments) from 2 major United States universities. The focus of the study was to uncover the way academics use 'paper-based' journal literature and then link this to the design features necessary for academics to accept and use EJs.

The results of Olsen's study illustrate that there are wide variations between faculty usage patterns of journal literature. For example chemists used journal articles intensely varying from "every hour" to "daily", but English faculty members used journal literature much more infrequently - at times not even weekly. Another way faculties of various disciplines differed broadly in their approach to literature was in the *methods* used to find background information on a new topic. Twelve out of sixteen chemists used computer searches, while only 1 English scholar used that method. English academics often used annual reviews (10 out of 14), while only six out of sixteen sociologists used that method and even fewer chemists (1 out of 16). The physical discomfort of reading EJs was the primary concern with all respondents who chose the response "to print anything which seems relevant" (p. 35). Many respondents also emphasised that scanning and flipping pages in a paper-based journal were important information finding tools to which scrolling on a computer could not equal (pp. 36-37).

In summing up the results of her study, Olsen concluded that while EJs have some advantages over printed journals (such as desktop access and faster print-time for articles), they also have some major disadvantages which can limit effective use of EJ articles. These include eyestrain from computer screens, less chance for serendipity and

not supporting effective scanning (Olsen, 1994).

Olsen's study points to possible contrasts between different disciplines' usage patterns of scholarly literature. However such small subject groups from only three disciplines make generalisations from this study difficult with the results being indicative only.

In 1994, Berge and Collins surveyed the readers of *Interpersonal Computing and Technology: An Electronic Journal for the 21st Century* (IPCT-J) and received 240 responses. Their survey provided interesting insights into a number of areas, including:

1. 79.1 percent of the respondents considered themselves to be "advanced", or "intermediate-advanced" computer users, and only 1.5 percent declared they were novices. Similar responses were found when respondents were questioned on their level of expertise using e-mail;
2. Just over 85 percent of respondents subscribed to other EJs, with 50 percent subscribing to 3 or more EJs;
3. 84 percent responded that they found IPCT-J's articles to be of similar, or better, quality than those found in print journals;
4. 14.2 percent of the respondent group stated they had already cited IPCT-J articles in their work;
5. Over 58 percent of respondents had sent an article to a colleague; and
6. Over 58 percent of respondents preferred to both read articles on-screen and print them out (Berge & Collins, 1996).

While this study was not exclusively aimed at academics, over 70 percent of respondents were involved in higher education. Using a self-selected group weakened the survey and as the only subjects sampled were readers of IPCT-J the authors cautioned generalising beyond the readership of the IPCT-J.

Schauder's (1994) extensive survey of academics during July to October 1992, in Australia, United States, and the United Kingdom, is one of the most widely cited research studies in this area. Three copies of his questionnaire were sent to 743 randomly selected senior academics. These academics were then requested to complete the survey and pass on a copy of the questionnaire to a randomly selected middle-level and a junior colleague. Five hundred and eighty two useable responses were received. His study investigated how publishing 'professional articles' in electronic form could contribute to academic communication and research.

Schauder conducted a thorough review of the literature and used this to develop his questionnaire, which was then pre-tested on faculty at the Royal Melbourne Institute of Technology. Five variables were used, including:

1. Country of residence;
2. Subject field the respondent was involved in;
3. Seniority in their institution;
4. The amount of research that was carried out by the respondent as a job component; and
5. The amount of use or non-use of academic computer networks by the respondent.

Selected results from this survey include:

- 39 percent of respondents were using electronic networks. Of this group, 92 percent used it for e-mail. This finding is supported by Majid and Abazova's (1999) study above;
- 14 percent of respondents used networks for "finding references to articles" (Schauder, 1994, p. 89);
- The perceived 'prestige' of a journal was an important factor influencing the decision to submit an article, to a specific journal, with a further 25 percent of respondents stating that the journal's prestige was of some

importance. Only 1 percent of respondents rated this criterion as being not important;

- 92 percent of respondents stated that a journal title's market dominance was an important factor (67 percent) or of some importance (25 percent) to their decision to contribute an article to a specific journal. Only 3 percent of respondents stated that this criterion was not important;
- 80 percent of respondents believed that the speed a journal took in accepting and publishing articles was either important (26 percent) or of some importance (55 percent) in influencing their decision whether or not to submit an article to a specific journal;
- 78 percent of respondents stated that refereeing of articles they *submitted* to journals was of 'some importance';
- 68 percent of respondents stated it was important and 23 percent of some importance that articles they *read* were refereed;
- 82 percent of respondents felt that publishing articles "was important to their career advancement" (Schauder, 1994, p. 90), with a further 14 percent believing publishing articles was of some importance to their career progression;
- 24 percent of respondents stated that they generally published 2 articles in any given year, with a further 20 percent stating they generally published 1 article each year;
- 35 percent of respondents believed their university would view publishing in EJs favourably in promotion and tenure (promotion and tenure) decisions and give them the same weight as publishing in paper-based journals. However, 33 percent of respondents did not know their university's stance and 12 percent thought their university would not view them favourably;
- Academics believed publishing articles in paper-based journals should take much less time than it does; and

- 75 percent of respondents preferred to read electronic articles as printouts rather than on-screen.

Schauder's study provided a thorough investigation into the relationship between academics and EJs. Though it should be noted that in the early 1990s, when Schauder's study took place, the number of academic EJs available was far less than today. As such, Schauder's study takes on a *historical* perspective.

Milne (1999) reported on a 1994 study of academics at the Australian National University which discovered that almost 70 percent of respondents browsed EJs.

A survey conducted on university faculty at Texas A&M University in 1995 revealed that "most of the faculty preferred print over electronic format" (Tenner, Gyeszly & Rholes, 1998). These results are supported by Hunter who wrote researchers "want both paper and electronic and, if forced to make a choice, choose paper" (1998). Indeed, if electronic journals are to compete successfully with paper-based journals, their articles must be perceived by their audience to be of high quality and value (Collins & Berge, 1994). This is also supported by Fisher's observation regarding the "conservatism of the author community" (1997) which she believed directly affected the viability of EJs as standalone products.

Harter and Kim (1996) conducted an empirical study of academic literature to access the extent EJ articles were being cited in EJs. The study focused on 74 scholarly EJs that published refereed articles. Of the 74 EJs in the sample, a total of 4 articles from the most recent edition, at the time of their study, (though it was noted that for 6 of the EJs there were fewer than 4 articles available) were used. The first 20 citations in each article were then analysed. Using this technique, 4,317 citations from 279 articles from 74 EJs formed the sample. The citations were then classified (online source, book, paper-based journal etc). The results in descending order included:

- Books (26.9 percent);
- Book Chapters (16 percent);
- Conference Proceedings (3.2 percent);
- Online Sources[6] (1.9 percent); and
- Other (7 percent).

Stewart's (1996) survey of 39 users of the *Chemistry Online Retrieval Experiment* (CORE) at Cornell University, attempted to elicit from the users of the CORE system their thoughts on the future and possible role of EJ systems, after participants were exposed to a limited sample of EJs during the CORE project. The data collected aimed to gather useful information for publishers to use in designing EJs. The full-text of 20 American Chemical Society journals formed the nucleus of the CORE project. The data-gathering instrument was open-ended, hour-long interviews with results aggregated and presented in percentages. Some of these results were:

1. Users preferred printed copies over reading articles on-screen; and
2. Users believed electronic publication was a speedier process than publication through paper-based journals.

Stewart's breakdown of the participants focused on qualifications and it was not clear how many were faculty or students. The small size of the sample group further weakened the reliability of this research study.

Harter (1996; 1998) assessed the impact EJs had on scholarly journal articles by conducting a citation analysis on thirty-nine scholarly, peer-reviewed EJs that had begun publication prior to 1993. Eleven of these EJs were available in both print and electronic formats, with the remainder being published only in the electronic medium. Harter highlighted that for the eleven journals available both in print and electronic formats his analysis could not discern from which format a citation had been drawn.

Harter's results indicated that the EJs in the sample had not impacted highly on scholarly research activities. Fifteen EJs had not been cited, thirteen EJs had only been cited one to five times, and a further three EJS had been cited between six to ten times. The top ranking journal, the *Bulletin of the American Mathematical Society* had over 1,500 citations. However, as this journal was available both electronically and in print form, there could be no determination regarding the impact of the electronic version.

The second most frequently cited EJ, the *Online Journal of Current Clinical Trials,* did not have a print counterpart, and had 190 citations during the sample period. At the time of Harter's study he concluded that the majority of scholarly, peer-reviewed EJs had had little or no impact on scholars in their disciplines. However, Harter's conclusion is seriously weakened by his small sample. Once the eleven journals available in both paper and electronic formats are removed, the remaining twenty-eight journals could not be considered as a representative sample of the 1,093 EJs available in 1996 (McEldowney, 1996).

However Harter's results support Harter and Kim's (1996) research, with both studies indicating that by the mid 1990s most EJs were not heavily cited in research articles by academics.

Tomney and Burton's (1998) study of academics indicated how influential local factors can be on the uptake and usage of EJs. In their study of a stratified random sample of 147 academics from five faculties in a British university, the authors noted how the results from the Law Department, where staff members were involved in the production of an EJ, raised the awareness and usage of EJs by that Department when compared to other Departments (1998). Tomney and Burton conducted their study in late 1996 and early 1997 to examine the attitudes towards and usage of EJs by academics. Seventy-five respondents returned the questionnaire giving a 51 percent response rate.

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[6] Online sources included a range of source material including web pages (12 citations), newsgroup or listserv postings (12 citations), e-mail (10 citations), and EJs (9 citations).

Some of the results of this study included 28 percent (21 respondents) had used EJs, with only two departments (History and Further Education) reporting no usage of EJs. Table 1 illustrates Tomney and Burton's results by faculty.

Table 1 Tomney and Burton's Study - Use of EJs by Faculty (Number and Percentage of Replies by Faculty)

Faculty	Using EJs (percentage)	Not Using EJs (percentage)	Total
Business	8 (44.4)	10 (55.6)	18 (100)
Science	4 (36.4)	7 (63.6)	11 (100)
Engineering	6 (30.0)	14 (70.0)	20 (100
Education	2 (13.3)	13 (86.7)	15 (100)
Arts	1 (9.1)	10 (90.9)	11 (100)
Total	21	54	75

Table 1 clearly illustrates how the majority of academics, across every faculty, were not using EJs at the time of the study.

- Only 12 percent of professors, 34 percent of senior lecturers and 26 percent of lecturers had used EJs;
- 56 percent of academics under 40 years of age had used EJs, with only 14 percent of respondents belonging in the over 40 years of age category having used them;
- Both users and non-users of EJs made use of other electronic resources such as e-mail, discussion lists or the Internet. Tomney and Burton suggested that this indicated that "familiarity with other [electronic] resources does not necessarily encourage or promote the use of electronic journals" (1998, p. 423);

- 71.4 percent of respondents thought the quality of articles in EJs to be the same as paper-based journals, with 2 respondents believing they were 'somewhat' or 'much' lower quality, and 4 'did not know';
- 6 respondents (8 percent) had submitted articles to EJs, although of these 2 also had corresponding paper-based editions;
- 12 respondents (16 percent) downloaded and printed articles, 5 (6.7 percent) only downloaded articles to their computer, 8 (10.6 percent) noted the EJ articles reference details and 1 (1.3 percent) read EJ articles online;
- 7 respondents (9.3 percent) thought that EJs were not as highly regarded as paper-based journals;
- 3 respondents (4 percent) believed that the standard of articles was not high enough in EJs;
- 29 (38.6 percent) believed that the "potential for alteration" (1998, p. 426) was a disadvantage of EJs;
- When asked 'would you consider using electronic journals in the future?' over 80 percent of respondents said 'yes';
- Only 7 respondents (9.3 percent) thought that the speed in accepting and publishing articles would be an advantage of EJs over paper-based journals;
- 18 respondents (24 percent) believed that EJs were not as prestigious as paper-based journals; and
- 17 respondents (22 percent) were concerned with the "uncertainty over future archival copies" (1998, p. 426).

From their results Tomney and Burton concluded that "although they [academics] are not using electronic journals in large numbers yet, academics are aware [of EJs] ... and are not dismissive of the possibility of this type of publishing" (1998 p. 428). The authors also concluded that some areas of academia, such as Arts and Humanities, would be slower to adopt EJs than others, such as Science and Engineering.

However, the results of Tomney and Burton's study must be viewed with some caution given the small size of their sample. Indeed, to conclude that faculties such as Arts will be slower in adopting EJs than Science and Engineering is a giant leap given their sample size of eleven and thirty-one respondents respectively.

With their sample's margin of error[7] being 8 percent (for the total sample), then Tomney and Burton's results and conclusions can only be viewed as indicative and should be interpreted as such. This point is particularly strong when Tomney and Burton endeavoured to compare sub-groups of their total sample, when the margin of error would have increased to such an extent as to make such comparisons statistically meaningless.

Tomney and Burton's study contrasts strongly with the results Milne (1999) obtained earlier in the 1990s. Less than 34 percent of Tomney and Burton's respondents reported using EJs, whereas Milne discovered that almost 70 percent of academics at the Australian National University had browsed EJs by 1994.

Speier et al. (1999) surveyed a stratified random sampling of 1,264 business school faculty from ninety-five American universities with 300 respondents. Ninety-one percent of respondents were thirty-six years of age or older, 70 percent were tenured and 81 percent were Associate Professors, full Professors, department chairs, or college deans.

The study's findings found that:

- More than 50 percent of respondents were 'somewhat aware' to 'not aware' in regards to electronic publishing, with 17 percent being 'fully aware' and 7 percent stating they were 'very aware';

[7] The margin of error in a sample = 1 divided by the square root of the number of people in the sample (Niles, c. 1996b).

- More than 75 percent of respondents had either 'rarely' to 'never' read electronic publications, with only 1 percent being frequent readers;
  - Faculty reporting a high awareness of EJs tended to be younger than their less aware colleagues;
- 60 percent had never, and never intended to, submit an article to an EJ, 16 percent had rarely submitted an article to an EJ and 1 percent had either frequently or intended to submit articles to EJs in the future;
- Faculty members who were more prolific authors had a greater awareness of EJs than their less active colleagues;
- The findings also indicated that there were significant differences in the "awareness, reading, and intent to publish in electronic outlets across disciplines" (p. 541);
- When asked to evaluate and compare the quality of an article in peer-reviewed EJs and paper journals, 62 percent stated that EJs would contain articles of 'somewhat lesser quality' to 'substantially lesser quality', with only 2.5 percent believing EJs would contain 'somewhat better quality' to 'substantially better quality'; and
- When asked to evaluate the quality of articles in top quality paper journals that had gone electronic it is interesting to note that 21 percent of respondents believed the EJs would contain articles of 'somewhat lesser quality' to 'substantially lesser quality', with only 8 percent believing the quality would improve. While the majority, 67 percent of respondents, did not believe the quality of the journal would change.

This study contrasts with Schauder's study where 91 percent of respondents stated that reading refereed articles were either important or of some importance to them. However Speier et al.'s study indicates that the referee process for EJs may be viewed cynically by academics with their expectations being that EJs will contain somewhat substantially poorer quality articles, even when these articles have been peer-reviewed.

Brown's (cited Hyldegaard & Seiden, 2004) study on the information seeking behaviour of scientists supported Speier et al.'s finding that academics in different faculties had diverse information seeking preferences leading to variations in the usage of EJs.

Pullinger's (1999) study also indicated, similarly to Tomney and Burton (1998) how the local information environment might impact on how academics use EJs. In 1996, seventy users from four universities completed Pullinger's questionnaire. The results found:

- 94 percent of respondents used the Internet at least weekly;
- 80 percent of respondents used online bibliographic databases at least weekly;
- 63 percent of respondents browsed library-held paper-based journals of interest to them; and
- 54.4 percent of respondents reported using EJs at least weekly, 13 percent used EJs monthly, 18.6 percent occasionally and 14 percent stating they had never used EJs.

Pullinger found that local factors such as:

- The respondent's library's holdings of paper-based journals;
- The accessibility of the library, such as its opening hours, the distance to the library building, if the library houses a centralised versus a de-centralised collection;
- How extensively EJs had been promoted;
- The availability or sophistication of the institution's technical infrastructure; and

- The amount and frequency of training or support offered to the academics to learn how to discover, use and locate articles of interest affected the take-up and usage of electronic library services such as EJs.

However, similarly to Tomney and Burton's study Pullinger's results must be viewed cautiously given the small size of his sample. Pullinger's results have a margin of error of 12 percent. However, unlike Tomney and Burton, a number of Pullinger's results were quite strong e.g. over 90 percent of respondents using the Internet on a weekly basis.

The Max Planck Society (MPS) is a major German interdisciplinary pure research society with over 2,000 permanent researchers and, on average, over 6,000 visiting fellows, doctoral and post doctoral researchers visiting MPS Institutes each year. Rusch-Feja and Siebeky's (1999) study examined researchers' amount of use and acceptance of EJs. From September 1998, MPS libraries provided access to all available EJs from Elsevier, Springer, Academic Press and the Institute of Physics. An online survey was carried out in 1999 to assess the project, with 1,042 responses (approximately 11 percent).

Rusch-Feja and Siebeky stated that their survey revealed a high acceptance of EJs, with usage varying from daily to once per month, with the median being once each fortnight. It should be noted however, that a significant number of respondents answered either 'not at all' or did not answer the question regarding their usage of EJs (approximately 300 respondents). While the authors' assertion of a high acceptance of EJs amongst researchers is true, their study also indicates a significant non-acceptance of EJs.

Respondents also expressed frustration at the lack of an integrated system to access all the EJs and it was noted that approximately 40 percent of respondents did not like having to understand multiple systems, log on IDs and passwords. Almost half of the respondents thought that reading from the monitor was a disadvantage of EJs. Almost 80

percent of respondents rated as being very advantageous being able to access EJs more quickly than their print counterparts.

When respondents were asked to choose between retaining or dispensing with certain library services, almost equal numbers gave directly opposing viewpoints regarding EJs and paper-based journals.

Fossmire and Yu's (2000) citation analysis contrasted with Harter's 1996 study. Fossmire and Yu restricted the scope of their study to free scholarly EJs in the science, technology and medical disciplines. Their results indicated that the impact of scholarly EJs had significantly increased since Harter's 1996 study. Forty-seven titles out of the sample group of eighty-two "had received at least one citation in the *Web of Science*[8] during 1999" (Fossmire and Yu, 2000). Of the forty-seven titles, thirty-four had never appeared as paper-based titles.

Rowley (2001) reported on an ambitious Joint Information Systems Committee (JISC) research study, the *JISC User Behaviour Monitoring and Evaluation Framework*. This framework observed the changes in user behaviour towards electronic information resources in United Kingdom higher educational institutions. One of the key findings included that usage of EJs by teaching and research academic staff was relatively infrequent.

Hyldegaard and Seiden (2004) reported an interesting observation from their qualitative study on fourteen doctoral students at the Royal Agricultural and Veterinary University of Copenhagen that as a way of coping with information overload the students would always read an article recommended by a colleague but viewed intelligence agents, such as automated searches with scepticism.

As "scholarly journals available in electronic format are fast becoming the rule and not the exception" (Fossmire & Yu, 2000) the more research conducted on their

[8] The *Web of Science* is an Institute for Scientific Information journal article database.

usability, accessibility, advantages and disadvantages, from the *library clients'* perspective can only enhance library professionals' understanding of their impact.

2.4 Electronic Journals: Tenure

As outlined earlier, there are many reasons why academics publish the results of their work, of which one of the most important is for the advancement of their careers in regards to promotion and tenure decisions. Varian (1997) has stated that an academics' publishing record counts extensively towards promotions and job security. Whalley (1996) has commented that academics wish to be published in "high quality journals for prestige, believing that the journal's high status will somehow rub off onto them". Björk (2004) observed that many universities use explicit guidelines, such as shortlists, numerical weighting and so on, for directing their academics to publishing efforts. A number of authors have asserted that paper journals may disappear from scholarship in the future (Odlyzko, 1994; LaPorte et al. c. 1995). Are then promotion and tenure committees recognising EJs as legitimate scholarship, as prestigious as established high-status paper journals?[9]

Anecdotal evidence given to Amiran et al. (1991) suggested that many academic authors believed that electronic publications would not 'count' towards tenure or promotion. Amiran et al. suggested that until academic institutions give electronic publications the same status as publishing in paper-based media, than "there is little likelihood that academic writers will feel it is worth contributing to electronic journals" (1991). Amiran et al. proposed that the peer-review process should give publications their legitimacy and not the medium of publication. Lancaster's (1995) survey of directors of university libraries and other academic administrators indicated that if EJs are refereed, that this will help their acceptability in promotion and tenure deliberations. Langston

[9] It should be noted that the United States-based universities place significant emphasis on publication for tenure and promotion. The situation at ECU is outlined in Section 3.3.5.

(1996) outlined a view similar to Amiran et al. and Lancaster, whereby Langston believed that when EJs mirror the established practices of paper-based journals (such as peer-review) then promotion and tenure committees will be prepared to reward EJ authors.

Collins and Berge stated that the "biggest obstacle to e-journals' credibility is whether tenure committees will accept publication of an article in an e-journal as equivalent to publication in a print journal" (1994, p. 774). A view repeated by Leslie, who noted that

> Most of the current members of university tenure committees belong to the last generation of scholars not steeped in the computer culture, and have so far declined to acknowledge publication in electronic journals as a 'credential for promotion' (Leslie, 1994).

Cronin and Overfelt (1995) also claimed that the tremendous growth in EJs should challenge the established norm of tenure committees rewarding print-only publishing. They raised the question concerning how "the academic reward system is adjusting to changes in scholarly publication media and practices" (1995, p. 774). To test if the tenure and academic reward system was changing to recognise EJs and other e-publications, Cronin and Overfelt surveyed 168 departments in fifty public and private universities in the United States, requesting copies of their promotion and tenure guidelines. Forty-nine replies from thirty-five different universities were received from a mixture of departments. After analysing the promotion and tenure documents the authors noted that only one university explicitly recognised electronic publishing, and then the "implicit assumption was that publications in 'electronic format, and electronic bulletins' were of the non-refereed variety" (1995, p. 701). The authors believed that the tenure "picture is muddied" (1995, p. 702). When comments from tenure committees were compared to the non-format specific language in the institutions' promotion and tenure documents it suggested that promotion and tenure committees interpreted their own

policies inconsistently with, as one respondent wrote, an "implicit bias toward print" (1995, p. 702).

Recommendation 289 of the United Kingdom's Follet Report stated:

> To help promote the status and acceptability of electronic journals, the Review Group also recommends that the funding councils should make it clear that refereed articles published electronically will be accepted ... on the same basis as those appearing in printed journals (cited Chan, 1996).

Following on from the Follet Report, the Research Assessment Exercise of British Universities explicitly stated that "electronic publications are [to be] treated on the same basis as those appearing in printed journals, provided they appear in peer-reviewed journals" (Chan, 1996).

Speier et al. (1999) surveyed a stratified random sample of 1,364 business school faculty from ninety-five American universities and received 300 responses. Of these ninety-five respondents were, at the time of the survey, sitting on promotion and tenure committees and they were asked to give their opinions and evaluate and compare articles in peer-reviewed EJs to those in paper journals. Fifty-seven percent of respondents believed that EJs generally contained articles of somewhat lesser to substantially lesser quality articles, with only 2 percent believing EJs would contain better or substantially better quality articles. Forty-one percent of respondents were neutral. When asked to evaluate the quality of articles in former top quality paper journals that had gone electronic, 23 percent of respondents believed EJs would contain articles of somewhat to substantially lesser quality articles, with 4 percent of respondents believing the changeover would lead to better to substantially better articles. Seventy-two percent of respondents remained neutral.

Speier et al.'s survey included academics not at the time sitting on promotion and tenure committees and it should be noted that there was little variance in the responses from the survey's total respondents (n=300) to the respondents sitting on promotion and tenure committees (n=95).

While Speier et al.'s survey was conducted in the United States; it appears that the United Kingdom's Follet Report and Research Assessment Exercise of British Universities policy has not significantly impacted on the opinions of academics sitting on promotion and tenure committees.

Ginsparg recorded informal anecdotal reports from "a number of colleagues" (1996) who reflected views that conflict with Cronin and Overfelt and Speier et al.'s results. Ginsparg's colleagues considered that the "unqualified number of published papers ... [as being] too coarse a criterion and plays essentially no role" (1996) when evaluating grant requests or promotion and tenure applications. Instead, letters of recommendation from trusted sources was given far greater weight.

CHAPTER 3

DESCRIPTION OF EDITH COWAN UNIVERSITY AND RESEARCH HYPOTHESES AND QUESTIONS

3.1 Introduction

This chapter contains four sections:

1. Introduction;
2. A description of ECU, which also gives details on ECU's library's collection, facilities and the provision for Internet training at the time the research was undertaken;
3. The study's research questions and hypotheses are set out; and
4. Assumptions made in conducting the study.

3.2 Description of Edith Cowan University

ECU was chosen as the subject of the study largely due to convenience. At the time the research study was proposed, the Researcher lived in a remote rural location in Australia and did not have ready physical access to academics. The Researcher recognised the limitations of her location and that access to an academic community where onsite assistance would be available was essential. As the Researcher was enrolled as an external student at ECU, the ability to gain support from her supervisor and ECU support staff to coordinate the mailing of the surveys and to forward completed surveys to the Researcher's home made the choice of ECU straightforward.

ECU is a multi-campus university with three campuses in metropolitan Perth, the State capital of Western Australia, and a fourth in Bunbury, a major regional centre just over two hundred kilometres south of Perth (Edith Cowan University, 2001a). In 2000 over 290 courses were offered from undergraduate to doctorate level through:

1. Western Australian Academy of Performing Arts;
2. Faculty of Communications, Health and Science;
3. Faculty of Community Services, Education and Social Sciences;
4. Faculty of Business, Legal Services and Public Administration; and
5. Bunbury.

ECU is the second biggest university in Western Australia and enrols approximately 30 percent of that State's university students (Edith Cowan University, c. 2001a). It has been noted that ECU has a strong focus on the service professions and that this focus is ingrained in the wider public's perception and ECUs policies, practices and strategic directions (Australian Universities Quality Agency, 2004).

Table 2 sets out the student and staff statistics for ECU from 1998 to 2002 (Edith Cowan University, 2003a). When the survey was first mailed out in the second semester of 1999, ECU had a student enrolment of 19,984. This slightly decreased in 2000 to 19,804 students. Unfortunately, the Researcher has been unable to obtain a reliable source giving the full-time-equivalent (FTE) faculty staff numbers for 1999[10] however, in 2000 there were 596 FTE faculty staff (Edith Cowan University, c. 2001b). While Table 2 illustrates that FTE ECU staff numbers slightly declined from 1999 to 2000, it can be assumed that if there was any variation in FTE faculty staff, it would have been minor.

[10] Refer to Section 4.10 for details

Table 2 Student and Staff[11] Data as at March 2002

	1998	1999	2000	2001	2002
Students					
Full-time Students	11,171	11,069	11,096	11,735	12,920
Part-time Students	5,412	5,129	4,951	4,815	4,849
External Students	3,159	3,786	3,757	3,379	3,430
Total Students	19,742	19,984	19,804	19,929	21,199
Staff					
FTE Staff #	1,880.9	1,793.8	1,774.9	1,793.5	1,815.0 #

Includes an estimate of casual staff FTE

ECU has "a large number of distance education students and a developing offshore program and a growing number of online or partially online courses" (L. Leslie, personal communication, June 24, 2001). As Table 2 illustrates in 2000 external students represented approximately 19 percent of student enrolments.

In 2000 ECU classified its academic staff according to a Level A to E scale, where levels A and B were for Lecturers, level C for Senior Lecturer, and levels D and E for Associate Professors and above. In 2000, ECU had 199 academic staff at Senior Lecturer or higher (33 percent of the academic population) and 397 Level A and B Lecturers (67 percent of the academic population)[12].

It is noted that the study possibly may not have drawn a close representative sample from ECU's population, according to job title. As can be seen in Table 3, Column

[11] Includes academic and support staff

3 below, the sample achieved 58.5 percent of respondents who nominated themselves as being Lecturers, whereas ECU had 67 percent of its population being Level A and B Lecturers in 2000. This is a difference of 8.5 percentage points which is statistically significant.

At the time the questionnaire was compiled, the Researcher did not have access to ECU's terminology for classifying its academic staff. It could be speculated that had the survey's question 4 been aligned with ECU's internal academic level classification scheme, the results might have given a different result. As such, these results are indicative only as to the sample's demographic accuracy.

Table 3 ECU Academic Staff Job Title

Job Title	Frequency	Percent
Lecturer	121	58.5
Senior Lecturer	43	20.8
Researcher	8	3.9
Head of School	7	3.4
Other[13]	27	13.0
No Answer	1	0.5
Total	207	100[14]

3.2.1 ECU Library Snapshot

ECU has four branch libraries at each of ECU's four campuses and they house information resource materials available for staff and students, both on and off campus, with the "collections at each campus [reflecting] the courses taught at the particular

[12] Source: Edith Cowan University, c. 2001b, Table 4.11 *2000 Full-time and Fractional Full-time Academic Staff by Campus and Current Classification,* p. 186.
[13] Amongst the 'Other' responses job titles received included: Consultant (2), Assistant Professor (12), Professor (2) and Associate Dean (3).
[14] The actual figure is 100.1 percent which becomes 100 percent when rounded for presentation in the table.

campus" (Edith Cowan University, 2003c). On campus opening hours at the three metropolitan Perth campus libraries during semesters, are generally:

- Monday to Thursday 8am to 9.30pm;
- Friday 8am to 5pm; and
- Saturday and Sunday 12.30 to 5pm.

Bunbury campus has slightly reduced opening hours (Edith Cowan University, 2003e).

Table 4 sets out ECU's Library's volumes and serial subscriptions statistics from 1998 to 2002 (Edith Cowan University, 2003a). When the survey was first mailed out in the second semester of 1999, ECU's Library subscribed to 14,701 journal titles. This slightly decreased in 2000 to 14,611, coinciding with the slight decline in academic staff and student enrolments. While it is noted that serial subscriptions slightly declined from 1999 to 2000, it can be assumed that this would have had minimal, if any, affect on the survey's results.

Table 4 Library Collections as at December 2002

	1998	1999	2000	2001	2002
Library Collections					
Volumes Held	577,941	625,458	787,487	626,766	700,591
Serial Subscriptions	14,811	14,701	14,611	16,343	18,693

The first full-text CD-ROM system, BPO Business Periodicals Ondisc, was installed in 1996 and its journal titles were added to the library's catalogue in 1997 (L. Leslie, personal communication, June 24, 2001). As Leslie (personal communication,

June 24, 2001) stated "since 1998 the library has invested solidly in web resources with the full text titles being added to thew [sic] library catalogue since the end of 2000". Leslie (personal communication, June 24, 2001) also stated that in 2001 ECU's Library purchased:

- Blackwells Science;
- Wiley Interscience;
- Emerald bundles of EJs;
- A subscription to the Institute of Electrical and Electronics Engineers (IEEE) All Society periodicals package; and
- An extension of their Proquest databases to the PDQ[15] 5000 set.

By June 2001, ECU had 5,723 EJ titles in its catalogue (L. Leslie, personal communication, June 24, 2001) which included:

- Titles in full-text databases;
- EJs that were free when the print title was subscribed to;
- Direct subscriptions; and
- Gratis titles.

In 1998 ECU's Library introduced a policy that 30 percent of its collections and access budget was to be allocated to digital resources (L. Leslie, personal communication, June 24, 2001). This included:

- Databases;
- EJs; and
- E-texts.

Leslie (personal communication, June 24, 2001) outlined that the main driver for this policy was to enhance client service and support flexible delivery tailored to suit

clients' access to library resources from home. Coupled with this was the objective of moving away from providing CD-ROMs to a web environment which ECU's librarians believed would be more efficient to manage (L. Leslie, personal communication, June 24, 2001).

Leslie (personal communication, June 24, 2001) summarised the methods to promote EJs to ECU's academics as including:

- Reports to faculty committees;
- Memos to individual coordinators;
- Articles in *Research Contact*[16], or School newsletters; and
- Guides to ECU library information resources and services tailored to specific disciplines or schools.

3.2.2 Training for the Internet

Tilbrook has stated that the two underlying causes for academics not using the Internet or e-mail were "a lack of training and lack of time for learning [them] properly" (1999a).

In Tilbrook's (1999a) description of ECU's introduction of a new campus-wide standard e-mail package it was disclosed that ECU did not have a standard computing environment prior to mid 1998. In late 1997 a survey on e-mail usage within ECU discovered that as many as eight different e-mail programmes were in use.

Tilbrook's paper highlighted the dilemmas facing the University's Educational Development Unit (EDU) in implementing an effective training programme to train ECU staff in the new e-mail package and for ECU's librarians in offering Internet training to

[15] Produced by the U.S. National Cancer Institute (Silver Platter, c.2003)
[16] *Research Contact* is a journal that provides "a medium through which student researchers, supervisors, and other interested staff can obtain information about conducting and reporting research, services and

staff or faculty. With many different e-mail programmes in use there would be a variety of Internet browsers in use with different jargon and functionality making effective training difficult.

In introducing the new e-mail programme, consideration was given to:

- Whether staff that had not previously used any e-mail package need to be given basic instruction in using e-mail?
- Whether staff that had previously used e-mail need training or would self-guided instructions suffice?
- Whether staff that had previously used only very basic e-mail (such as solely sending, replying to and forwarding) need to receive instruction in facets such as formatting, using address books, attachments or remote access?
- Whether training in advanced software features should be available for all staff? Or after receiving initial training?
- Whether handouts should be developed (hard-copy or online?) and should these be available only for course attendees or for all staff?
- Whether training should be ongoing to capture new staff or offered as a one off?

While these dilemmas were concerned with learning an e-mail software programme, they are indicative of the issues ECU's librarians needed to consider when upskilling its academics in using the Internet for research purposes.

Indeed, perhaps because of these issues by mid 2001, ECU's librarians had not established a formal training programme for academic staff to learn how to use the Internet (L. Leslie, personal communication, June 24, 2001). Leslie (personal

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resources available to research students, and research activities occurring in the University" (Edith Cowan University, 2003a)

communication, June 24, 2001) described the training available to academic staff at the time this study's survey was conducted as including:

- Informal sessions, offered occasionally;
- Appointments made with faculty specialist librarians;
- Overhearing instructions been given to the Faculty member's students during student Internet training sessions;
- On the spot training offered by Reference Librarians if the academic were to ask for assistance; and
- Liberty Learning[17], while aimed at students, was available through the Internet and so may also have been used by academics.

No statistics have been kept by ECU's librarians regarding how many academic staff have received Internet training by any of the above methods (L. Leslie, personal communication, June 24, 2001).

Clayton (1999) has stated that at the time of his study, most academics in Australia had used self-instruction or asked colleagues or friends for help in learning how to use the Internet. Clayton then asserted that this challenged the established 'trainer-trainee' method librarians have employed when upskilling clients by by-passing them. The situation at ECU can neither support nor refute this assertion as formal methods of Internet training have not been routinely available, thereby almost compelling academics to utilise informal networks or self-instruction.

Pullinger (1999) and Tomney and Burton's (1998) studies have both indicated that local factors, such as the availability of EJs, the effectiveness of promotion programmes, the amount and frequency of training and so on may potentially impact on the usage of EJs. ECU's lack of formal Internet or EJ training for academics and the diverse computing environment until just before the survey was conducted would

[17] Self-paced learning modules provided online and covering such topics as *Introducing your Library Services, Searching the World Wide Web* etc (Edith Cowan University, 2003d)

potentially impact the usage of EJs. Even more significantly, while Leslie (personal communication, June 24, 2001) has asserted that since 1998 ECU librarians have invested heavily in web resources it is also noted that the titles of electronically available journals were not added to the library's catalogue until late 2000, after this study's survey of ECU's academics. It can therefore be assumed that this would have negatively impacted on ECU academics' knowledge about the availability of EJs in their subject or interest areas.

3.3 Hypotheses and Research Questions

This study will investigate differences in usage of EJs according to:

1. Faculty;
2. Age;
3. Gender;
4. Amount of time since last qualification;
5. Research activity; and
6. Level of internet training.

The differences listed above will be investigated according to:

1. Personal subscriptions (free or paid) to any academic electronic journals;
2. Citations of EJs;
3. Intention to cite EJ articles in the future;
4. Submission of articles to EJs in the years 1994 to1998;
5. Intention to submit articles to EJs in the future;
6. Belief that EJs have poor or inconsistent quality of articles;
7. Belief that publishing in EJs does not contribute to promotion or tenure;
8. Use of EJs when researching a new topic; and

9. Personal use of EJs to keep in touch with topics associated with areas in which the academic teaches and/or has qualifications.

Section 3.3.7 outlines the 20 research questions this study will also investigate to gain a further understanding of academics' attitudes towards and usage of EJs.

3.3.1 There are Differences in the Usage of EJs by Faculty

Olsen's (1994) study indicated how there are marked differences in the way faculties use journal literature. Olsen's results highlighted that chemists use computerised searching as their prime method for finding background information on a subject, yet this method was ranked third for sociologists and hardly ever used by humanists (Olsen, 1994, p. 41). Applebee et al.'s (1997) results discovered that the usage of the Internet and e-mail differed according to faculty, with the Faculty of Information Sciences and Engineering being the heaviest users. Tilburg University's (c. 1998) study also found that there was significant difference in the use of EJs across different academic disciplines. Speier et al.'s (1999) study also indicated that there are large variances in the way different disciplines are either aware, use or intend to publish in EJs. Speier et al. (1999) concluded that Faculty in computer-integrated disciplines such as accounting, information science or finance were more likely to have incorporated EJs into their academic work. Brown's (cited Hyldegaard & Seiden, 2004) study also demonstrated differences in the way different faculty use EJs. These results have been supported by more recent studies including Tenopir and King's (cited Bonthron, Urquhart, Thomas, Armstrong, Ellis, Everitt, Fenton, Lonsdale, McDermott, Morris, Phillips, Spink & Yeoman, 2003) review of EJ studies from 1997 to 2001, where the authors noted there were considerable differences in the usage of EJs among disciplines.

Therefore, it is hypothesised that Faculty in ECU's Communications, Health and Science and Business and Public Management faculties should be the heaviest users of EJs and demonstrate a greater interest, awareness of or disposition to use them in the future than other ECU faculties.

3.3.2 There are Differences in the Usage of EJs by Gender

Applebee et al.'s (1997) results implied that gender differences were a significant factor influencing usage of e-mail and the WWW, with males being heavier users. These results contrast with Majid and Abazova's (1999) study which found that female respondents were heavier users of the Internet.

While there is conflicting results according to gender, regarding Internet usage this study hypotheses that there are differences, according to gender, in who are the heaviest users of EJs and that males will demonstrate a greater interest, awareness of or disposition to use EJs in the future.

3.3.3 There are Differences in the Usage of EJs by Age

Tomney and Burton's (1998) study indicated that age was an important factor influencing whether an academic would be inclined to use EJs. As noted earlier in Section 2.3, the small sample Tomney and Burton used made their conclusions indicative at best. However, Speier et al.'s (1999) study on a larger sample supported Tomney and Burton's assertion and indicated that an academics' awareness of EJs was influenced by age with younger academics being more inclined to be accepting of EJs.

However both these studies contrast with Applebee et al.'s (1997) and Majid and Abazova's (1999) results indicating that there was no statistical significant difference in the age of academics and their usage of the Internet.

While it is noted that the studies above did not investigate the same areas, it does highlight that researching the influence of age on a subject's usage of EJs is an avenue worth pursuing.

This study hypothesises that younger Faculty in ECU will be the heaviest users

of EJs and demonstrate a greater interest, awareness of or disposition to use EJs in the future than 'older' ECU faculty.

3.3.4 There are Differences in the Usage of EJs by the Amount of Time Passed Since Last Qualification

Age as an influencing factor on academics' usage of EJs has been investigated by a number of authors (Applebee et al., 1997; Majid & Abazova, 1999; Speier et al. 1999; Tomney & Burton, 1998). However, the length of time since an academic's qualifications were conferred, a related but separate query, appears to have been ignored by the research community and is worthy of investigation.

Speier et al. (1999, p. 541) noted that academics with tenure were more likely to have submitted and intended to submit articles to EJs and hypothesised that this may be due to their being more senior and established and therefore more prepared to experiment with publishing in EJs.

This suggests that there is a possibility that academics with a greater amount of time having passed since their last qualification, assuming that this would have given them the opportunity to establish their reputations in the research community, might be more willing to either read or submit or intend to submit articles to EJs.

Therefore, it is hypothesised that faculty with the greatest amount of time passing since their last qualification will be the heaviest users of EJs and demonstrate a greater interest, awareness of or disposition to use them in the future than other ECU faculty.

3.3.5 There are Differences in the Usage of EJs by Amount of Research Activity

Speier et al.s (1999) study noted that faculty members who were more prolific publishers also tended to have a greater awareness of EJs than their less prolific colleagues.

The ECU document *Research Activity Index (RAI): Guidelines for the collection of 2002 data* (2003d) sets out the principles for the distribution of research funds to ECU faculty.

Research funds are distributed at ECU:

- Based on the Faculty's staff members' research input and output from the previous year;
- To stimulate academics to increase their research productivity;
- To reward academics for their research achievements;
- To provide the means for continued scholarship without the need for the academic to submit continual research proposals;
- Based only on the points the academic obtained in the Commonwealth Government's Department of Education, Science and Training (DEST) Higher Education Research Data Collection (HERDC) scheme[18] (Edith Cowan University, 2003d).

The presence of the HERDC scheme is designed to encourage Faculty at ECU to conduct research and publish the results of that research. At such times, the faculty member would also usually review the literature. As Speier et al.'s study noted however, the prolific publishers tended to also be more aware of EJs then the less productive colleagues.

Therefore, it is hypothesised that academics who are the most prolific publishers will be the heaviest users of EJs and demonstrate a greater interest, awareness of or disposition to use them in the future than other ECU academics.

[18] Further details on HERDC can be found at http://www.dest.gov.au/highered/research/herdc.htm

3.3.6 There are Differences in the Usage of EJs by Level of Internet Experience

As noted in Section 2.1, the level of familiarity an academic has in using the Internet is considered an influencing factor on their usage of EJs. Tomney and Burton's (1998) results indicated that an academic's familiarity with electronic resources (such as e-mail, discussion lists or the Internet) may not increase the likelihood of their usage of EJs. Clayton (1999) noted that while some academics used the Internet, most were infrequent or non users. Clayton's report on a 1997 survey of 539 Australian academics stated that 67 percent of respondents used the Internet at least daily or weekly, just over 25 percent used the Internet less than once per week and 7.1 percent asserted they never used the Internet. Clayton's results contrasted quite strongly with Pullinger's (1999) results from the United Kingdom, which reported that 94 percent of respondents used the Internet at least weekly. The high level of Internet usage by Pullinger's academics also saw a corresponding high usage of EJs, with just over 54 percent reporting using EJs at least weekly.

Therefore, it is hypothesised that academics who classify themselves as having advanced experience in using electronic networks, such as the Internet, will be the heaviest users of EJs and demonstrate a greater interest, awareness of or disposition to use them in the future than other ECU academics.

3.3.7 Hypotheses Results

The survey results relevant to the above hypotheses will be presented in Chapter 5.

3.3.8 Research Questions

This study also seeks to provide answers to the following questions:

1. What Internet training have ECU academics received?

Applebee et al. (cited Tilbrook, 1999a) discovered during their review of the literature that academics have often reported their need for training in using the Internet. As Tilbrook (1999a) also stated, one of the underlying causes for faculty not using the Internet (and by default not accessing EJs) was a lack of training.

2. What methods do academics use to read or capture EJs?
   Berge and Collins' (1996) study indicated that over 58 percent of their respondents preferred to both read articles on-screen and print them out. This result contrasted with Schauder's (1994) study which found that 75 percent of his respondents preferred to read EJs as printouts rather that on-screen. However, Stewart's (1996) survey supported Berge and Collins and Stewart reported that respondents favoured printing and reading EJ articles over reading them on-screen. Tomney and Burton's (1998) research indicated that fewest respondents (just over 1 percent) read EJ articles only online and 16 percent chose to download and print EJ articles.

3. Are academics aware of their own work being cited in EJs?
   Citation analysis is one measure of the impact EJs may have on the research community (Hartner, 1996; Fossmire & Yu, 2000).

4. Do academics believe it is easy to subscribe to EJs?
   One of the perceived advantages of EJs given in the literature and outlined in Section 2.2 is that it is easier to subscribe to EJs. Given that this advantage had not been tested in the literature the assumption is worthy of being investigated.

5. Are academics able to find the information they need easily using EJs?
   Section 2.2 noted that one of the perceived advantages of EJs was the superior ways in which they may be searched, such as:

- The use of Boolean operators;
- Truncation; and
- Relationships between different search fields such as date, language.

Given that this advantage had not been tested in the literature the assumption is worthy of being investigated.

6. Are academics willing to publish in EJs?
   Speier et al. (1999, p. 541) noted that academics with tenure were more likely to submit and intend to submit articles to EJs and put forward that this may be due to having established their reputations and were consequently more ready to test publishing in EJs. This study proposes to investigate the general willingness of academics to publish in EJs.

7. Do academics believe that publishing in EJs has less status than publishing in paper-based journals?
   Tomney and Burton (1998) discovered that academics considered publishing in EJs was held in less esteem by their colleagues than publishing in paper-based journals.

8. Do academics believe that publishing in EJs is faster than publishing in paper-based journals?
   Stewart's (1996) study found that users believed publishing in EJs was speedier than publishing in paper-based journals. One of the supposed advantages of EJs given in the literature and outlined in Section 2.2 is that publication of EJ articles is much faster that paper-based journals.

9. Do academics believe that EJs will save paper?
   Woodward et al. (1997) asserted that one of the most frequently listed

advantages of EJs is that they will save large amounts of paper. This assumption is worthy of being investigated.

10. Do academics find that using EJs is more convenient than using paper-based journals?
    One of the advantages of EJs given in the literature and outlined in Section 2.2 is that using EJs is more convenient, as suers no longer need to access them at the office or library. This advantage is worthy of being investigated.

11. What role does the referring of articles play?
    Berge and Collins (1994) found that 84 percent of respondents to their survey thought that the IPCT-J EJ contained articles to be similar, or better, quality than articles in paper-based journals. Tomney and Burton's (1998) survey found that 71.4 percent of their respondents believed that EJs contained articles to be of the same quality as print journals, while only 2.6 percent believed they were either somewhat or much lower quality and 5.3 percent did not know. These results contrast strongly with Speier et al. (1999) survey's results which discovered that 62 percent of respondents from 95 American universities believed that refereed EJs contain 'somewhat lesser quality' to 'substantially lesser quality' articles when compared with refereed paper journals.

12. Are academics concerned about historical access to EJs?
    Faculty at Texas A&M University expressed concerns about the archivability of EJs (Tenner et al., 1998). Tomney and Burton's study also indicated that a number of academics were concerned with the "uncertainty over future archival copies" (1998, p.426).

13. Are academics concerned about the possibility of EJ articles being altered after they are posted?

Lancaster's 1995 (p.744), survey of academic administrators and university library directors discovered that most respondents were neutral about the dangers of electronic publishing – such as an author's work being changed once published to the Internet. Rowland (c. 1996) asserted that articles on the Internet must be 'fixed' and unalterable. Bergstein (2001) highlighted the example of a hacker inserting hoax quotes and misinformation in a number of Yahoo! Newspages in 2001. Tomney and Burton's (1998) study discovered that 38.6 percent of their respondents believed that the "potential for alteration" (1998, p. 426) was a weakness of EJs.

14. Do academics believe that EJs are less stable than paper-based journals?

    The literature review in Section 2.2 noted that academics are guarded about the stability of EJs. This perceived disadvantage is worthy of being investigated.

15. Do academics believe that eye strain, from reading EJs, is an important issue?

    Valauskas (1997) suggested that most people will not read lengthy text from a screen. Olsen (1994) concluded that a key drawback of EJs was eye strain from reading at computer screens. It has also been argued that many readers find the readability of text on a screen lower than on paper, that comprehension is lessened and reading large amounts of on-screen text is more fatiguing than from a page (Olsen, 1994; Valauskas, 1997).

16. Do academics believe that there is less chance for serendipitously finding useful articles using EJs?

    Olsen's (1994, pp 36-37) study concluded that academics believed

there was less chance for serendipitously finding useful or interesting articles in EJs than in print journals.

17. How frequently do academics read EJs?
    Rowley (2001) reported on a JISC initiative researching the changes in user behaviour towards electronic information in the United Kingdom, which indicated that EJs were being infrequently used by academics.

18. Do academics read EJs primarily at work or at home?
    This question seeks to enhance the results that will be obtained from researching question 10 above.

19. How often do academics make printouts of Interesting EJ articles?
    This question also seeks to enhance the results that will be obtained from researching question 2 above

20. Do academics send interesting EJ articles to colleagues or notify them of interesting articles?
    Berge and Collins (1996) found that over 58 percent of respondents, who were readers of IPCT-J had sent an article to a colleague. Hyldegaard and Seiden (2004) reported that their study's PhD students would always read an article recommended by a colleague.

The survey results relevant to the questions given above will be presented in Chapter 6.

3.3.9 Summary

This study will investigate six hypotheses and twenty research questions to determine the attitudes and usage behaviour of academics at ECU towards EJs. By doing this, the study will explore how and why EJs are either used or not used by this group.

3.4 Assumptions

Given the subjects and nature of the study, a number of assumptions have been made. These include:

1. Academics will be aware that electronic journals are available to them when conducting literature reviews or while remaining current with their profession;
2. The survey population will be familiar with the terms used in the questionnaire such as the 'Internet', and 'paper-based journals'. To ensure the consistent interpretation for 'electronic journals' a definition was provided;
3. The sample is representative of the population of academics at ECU. In selecting the sample size for the survey the Researcher was guided by the 'margin of error' mathematical formula and the survey research literature review in Section 5.2;
4. Respondents will endeavour to accurately and truthfully answer the questions posed in the survey;
5. Research activity carried out by respondents is an indicator of respondents' publishing activity;
6. The amount of time passing since the respondent's last qualification was gained is an indicator of their seniority or 'establishment' as an academic; and
7. Disciplines or Schools in Faculty at ECU will have similar characteristics enabling differences, by Faculty, towards EJs to be discernable.

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Introduction

This chapter contains twelve sections:

1. Introduction;
2. A discussion on the research method used in the study;
3. A description of the pilot survey and its place in the development of the final survey instrument;
4. A description of the study's population and sample;
5. An explanation of the final survey instrument;
6. An account on the first mailing of the questionnaire;
7. An account on the second mailing of the questionnaire to non-respondents;
8. Presentation of the response rate to the mail outs;
9. A discussion on the method of analysis;
10. An examination on the survey's validity and reliability;
11. Limitations of the study are examined; and
12. Ethical issues arising from the study are discussed.

4.2 The Research Method

Survey research was chosen as the research methodology for this study as:

1. It is often used when investigating the delivery of services;
2. It is one of the most common methods of investigating people's attitudes,

beliefs and behaviours;

3. Greater confidence can be had in the generalisability of survey research results than can be had from other methods; and
4. Surveys are superior in accurately documenting the norm, identifying extreme outcomes and in determining associations between variables in a sample (Gable, 1994, p. 114; Jick, cited Gable, 1994, p. 114; Mitchell & Jolley, 1988, p. 285; Trochim, 2002).

Marsland, Wilson, Abeyasekera and Kleih (2000) offered practical advice to guide researchers in the selection of the most appropriate survey technique and analysis method depending on the *objectives* of the research project and *constraints,* such as time, money and available expertise. Using Marsland et al.'s *Continuum of Objectives and Combinations of Instruments*, a formal sample survey methodology is appropriate when the objective of the research project is to "derive statistically valid, quantitative estimates that are representative of [the] target population" (Marsland et al., 2000).

Demming has identified thirteen different factors that can impede the usefulness of surveys (cited Denzin, 1978). They originate from the inherent characteristics that underlie the survey method and include using sampling models, the interviewers, respondents, and the procedures of coding and analysis.

Demming's sources of possible error using the survey method that could influence the results of this study include the following factors:

1. Variability in response, for example it is known that one person can give different answers to the same question at different times;
2. Differences in the form of surveys from
   (a) mail, telephone, and direct interviews;
   (b) intensive and extensive interviews; and
   (c) long or short schedules.

Demming holds that "too little is known about the effects of different

interview forms on the data that may be gathered by means of the survey" (cited Denzin, 1978, p. 168). Will different survey methods produce the same or different results?

3. Bias arising from the agency supporting the research. If the agency behind the research is known some subjects may choose to protect their own interests and not cooperate, may be impressed and willingly cooperate, or may alter their responses due to their own agendas;
4. Imperfections in the design of the questionnaire. There can be a lack of clarity in the questions, the same word can have different meanings to people or emotionally charged words may be used, or answers may be misinterpreted from the respondents' original meaning. For the survey method to succeed the researcher must phrase questions clearly and unambiguously so that each subject is in no doubt as to what their answer will be. "The supreme ideal is that all respondents will interpret an item the same way" (Coolican, 1990, p. 96);
5. Changes can take place in the sample or the larger population before analysis is completed;
6. Bias can result from non-response. A truly random sample from the larger population may not be achieved and so generalizations should not be made;
7. Bias which arises from an unrepresentative date or time period. For instance when asking for usage statistics if the subject is on leave or has just returned from holidays the amount might be different from their 'normal' work period;
8. Bias can arise from an unrepresentative selection of respondents. Researchers must start with a firm definition of the group they wish to sample and must ensure they have a representative sample;
9. Sampling errors, though Demming stressed this should be minimal if the researcher has carefully defined and enumerated the population;
10. Errors of processing, coding, editing and tabulating. Garfinkel (cited Denzin, 1978) believed that coding errors occur in all coding activities. He

also stated that coders may let uncodable responses pass as codable responses as the raw data from questionnaires is often translated into codable responses and then into numerical form, the researcher makes decisions about how each response is to be coded. The sum total of all these changes can be a large source of bias and error in any survey; and

11. Errors in interpretation through either
    (a) the respondent misunderstanding the questionnaire and the researcher failing to take into account the respondent's perspective; or
    (b) the researcher's own personal bias creeping into the interpretation process.

Mitchell and Jolley (1988) found that sometimes subjects do not know the 'right' answers to questions, but may think they do and so may answer incorrectly, especially if they have to rely on their memory and are giving numerical estimates for their behaviour in the past. Galliers (1992) was concerned about the self-selecting nature of questionnaire respondents, as those who feel strongly about an issue may be the only ones who participate, thereby biasing results.

However survey research is the most common research method of tapping peoples' attitudes, beliefs and behaviours (Mitchell & Jolley, 1988) and has many advantages and strengths over other methods. Gable (1994) stated that survey research serves well as a methodology of verification rather than for discovery. Mitchell and Jolley (1988, p. 286) assert that surveys are a useful correlational method and warn that the survey method is not useful if a causal hypothesis is being tested. Denzin believed that surveys should ideally repeat observations, use many groups for comparison, "combine theoretical with statistical sampling and employ some form of relational analysis" (1978, p. 179).

Some of the strengths of survey research include:

1. It is possible to study samples from which inferences about larger populations can be made as often there may be too many difficulties involved, or it may be too expensive to study whole populations;
2. Lack of response from mail questionnaires can be overcome by using follow-up questionnaires, interviewing a sample of non-respondents, or analysing non-respondent and respondent data to ensure that a representative sample has been achieved;
3. Fixed questions are easy to code or quantify and make numerical comparison feasible;
4. They can be used to compare responses between different groups, times and places;
5. Open-ended questions can deliver rich information that may not be gained from other methods;
6. They can be easy to administer;
7. It is possible to gather information from a large sample with less effort and expense than many other data gathering techniques;
8. They can be re-used easily;
9. A good deal of descriptive data can be yielded on selected variables;
10. The exact same instrument can be administered to a wide number of participants;
11. They allow the researcher to determine the values and relations of variables and constructs;
12. They can help verify and quantify the findings of qualitative research;
13. Relationships between variables can be identified; and
14. Some survey methods grant subjects anonymity which can lead them to be willing to disclose personal or sensitive information. (Coolican, 1990; Kerlinger, 1973; Mitchell & Jolley, 1988; Newsted, Huff & Munro, 1998).

Dillman and Lockhart (cited Rojo, 1995) have hypothesised that response rates

to surveys are dependent on the care and attention given to the total design and approach taken with respondents. Many factors have been discovered that may inhibit or stimulate the response rate to mail surveys. These include:

- The importance of the content or subject of the survey to respondents;
- The length of the survey;
- The timing of the administration of the survey;
- The nature of the cover letter and endorsement letters;
- Procedures for contacting respondents;
- Establishing follow-up procedures; and
- Guaranteeing the confidentiality of respondents' answers (Baumgarter & Heberlein; Dillman & Lockhart, cited Rojo, 1995).

Saltzman (cited Rojo, 1995) reported that response rates to surveys received through the mail varied from 1 percent for randomly selected samples to over 50 percent when incentives are used. The present research study used a sample drawn from a population who could be interested in the survey topic because, as academics, they have a vested interest in academic journals. As Sudman and Bradburn, and Baumgarter and Heberlein (cited Rojo, 1995) have hypothesised, when the sample group have an interest in the topic being investigated this usually has a positive affect on the response rate.

Lockhart's (cited Rojo, 1995) stages of returning behaviour were adapted for the present study and include:

1. Survey delivery.
   Sending a questionnaire does not guarantee its delivery. Members of the sample group may have left the institution, may be on sabbatical, and so on. The present research study utilised ECU's internal mail system, using an ECU mailing list to lessen the impact of this.
2. Ensuring the survey group opens and reads the survey.

Once the survey has been delivered, will it be opened or discarded? By using ECU's internal mail system, with no external postmarks on the envelope may assist in ensuring selected group open the envelope. Next, the respondent has to decide if he/she will read the covering letter. The design of the present research study's covering letters (Appendix C and D) utilised a catchy title "STOP 5-10 minutes of your time is needed" to catch participants' attention and encourage them to continue reading.

3. Ensuring the survey group decide to participate in the survey.
   The survey's covering letters (Appendix C and D) reinforced the importance of the survey to the academics' own self interest.
4. Ensuring the survey group respond to the survey.
   If respondents have not responded to the initial mail-out, a follow-up survey can be sent, and usually ensures respondents who intended to reply, but forgot, will do so, and may capture some respondents who may have been too busy during the initial mail-out. The present study followed-up non-respondents with a redrafted covering letter (Appendix C) and another copy of the questionnaire.

A survey of shipping logistics managers reported a nearly 40 percent drop in respondent numbers when an Internet survey was conducted over the previous years' paper survey (*Survey Methodology*, 1998). As Kiesler and Sproull (1986) have also noted, one of the major disadvantages of the electronic survey method is that subjects are automatically restricted to those who have access to the necessary equipment and networks and to those who are comfortable using the technology.

Kiesler and Sproull (1986) compared the response rate of a survey conducted electronically with an equivalent paper-based one. Fifty-one students and forty-nine faculty and staff employees were randomly selected from Carnegie-Mellon University's active institutional e-mail users. Overall, the paper-based survey had more respondents return their survey then returned the electronic e-mailed version (75 percent versus 67 percent). However, using the formula outlined earlier, it is noted

that this survey's margin of error was 10 percent making Kiesler and Sproull's comparisons questionable. Sproull (cited Kiesler and Sproull, 1986) discovered that employees responding to an e-mail questionnaire "gave more extreme answers than employees who answered on a paper questionnaire" (Kiesler and Sproull, 1986, p. 411).

Due to these factors, the use of an electronic delivery method for the questionnaire was rejected.

4.2.1 Summary

Marsland et al.'s (2000) *Continuum of Objectives and Combinations of Instruments*, provided guidance for selecting survey research as the research methodology for use in this study to increase the trustworthiness of its results and to provide legitimacy. Survey research has been used extensively when researching areas of a similar nature and its strengths and weaknesses are well known and influenced the design of the draft questionnaire (Appendix A), used in this study.

The literature review also provided assistance in the decision to combine structured questions with the opportunity to record their reasons or opinions regarding their choices. By eliciting respondents' views, confidence in the results is improved.

Drawing on the literature review the study used the following stages in conducting the research:

1. Presentation of the research proposal and development of the initial survey instrument (see Appendix A);
2. Piloting of refined survey instrument;
3. Further refinement of the survey;
4. Conducting the first mail out using the final survey instrument;
5. Conducting the second mail out to non-respondents; and

6. Analysis of results against the research questions and hypotheses.

4.2.2 Research Proposal

In 1998 the Researcher developed a research plan to satisfy the requirements of first stage in obtaining approval to proceed to conduct the current study. One component of the research plan entailed the submission of an initial draft survey. Questions in the initial draft survey were framed after a limited review of the literature (Berge & Collins, 1996; Collins & Berge, 1994; Edwards, 1997; Hitchcock et al., 1996; Langston, 1996; Luthor, 1998; McEldowney, 1996; Okerson, 1992; Rapple, 1995; Rowland, c. 1996; Rupp-Serrano, 1995; Schauder, 1994; Stewart; 1996). The literature review highlighted that by the mid 1990's many articles on EJs were general in nature and expressed only the personal opinions of the author, usually focussing on the perceived advantages or disadvantages of EJs. At the time the research proposal was made, the survey instrument intended to gather data on many of the alleged advantages or disadvantages to help build a solid foundation for anticipated future usage. A number of research studies were also investigated (Berge & Collins, 1996; McEldowney, 1996; Olsen, 1992; Schauder, 1994; Stewart, 1996) and these were also drawn upon in framing the pilot questionnaire.

Comments on the initial draft survey were received from the Researcher's tutor and the draft survey was refined.

The next stage necessitated the submission of a research proposal to ECU where the research questions, methodology and the refined draft survey were presented to obtain permission to proceed. At the time the research proposal was submitted the Researcher was living in a remote area of Australia and proposed piloting the survey instrument on a small number of lecturers at the Dubbo, New South Wales (NSW), Campus of the Western Institute of Technical and Further Education (TAFE). The research proposal received approval to proceed and unfortunately the study was delayed by the Researcher undertaking a major move interstate.

4.3 Pilot Survey

Initially the survey instrument was to be piloted on a group of lecturers at the Dubbo, NSW, Campus of the Western Institute of TAFE. However, after the Researcher relocated it became necessary to find another suitable group to pilot the survey. This became possible when the Researcher obtained work as a consultant at the Maritime Transport Unit (MTU), Australian Commonwealth Department of Transport and Regional Services.

In May 1999 a covering letter and questionnaire (Appendix A) was pre-tested on 30 members of MTU.

MTU was responsible for providing the Commonwealth Government of Australia with research and advice in relation to international and domestic shipping policies, including marine safety, environment, personnel, waterfront performance and competition policy. The group produced many publications, conference papers, journal articles and Ministerial briefing papers.

MTU was chosen for the pilot study due to:

- The convenience of testing on colleagues;
- The limited cost involved; and
- MTU's research and publishing responsibilities mirrored academic researchers.

Seventeen completed questionnaires were returned. The pilot survey's results were considered in light of Dillman and Lockhart's (cited Rojo, 1995) factors that may influence the response rate to surveys. The pilot survey clearly demonstrated a number of design flaws in the trial survey instrument, including:

- It became apparent respondents held strong views on EJs and wanted the opportunity to make comments throughout the questionnaire. Indeed, a number of respondents noted they did not have enough room to write their thoughts. To correct this problem, the grouped statements in Sections 3 and 4 was redesigned with each question being separated and five tick boxes were provided to indicate the respondent's opinion (Appendix B). By doing this it was possible to provide respondents with space for comments at every statement. However, this action doubled the survey instrument's length (from 3 pages to 6). Dillman and Lockhart's (cited Rojo, 1995) advice that the length of a survey could inhibit or stimulate response rates was considered by the Researcher, but it was believed any drop in response rate would be compensated by the richness of the qualitative information so gained. Additionally, at the end of the questionnaire a general comment area was provided to give respondents a further opportunity to offer their views on EJs or their possible use at ECU.
- Respondents also did not like having similar questions repeated through the questionnaire. A number of similar questions had been placed in the survey as a method of verifying the consistency of answers. However, as respondents had felt they were answering the same question twice and resented this, these questions were discarded.
- A number of potential participants declined to respond as they objected to having to provide their name and signature. This requirement was removed from the questionnaire.
- Question 6 was discarded as a number of respondents indicated that even though they were not aware of EJs they believed their opinions were still relevant and should be recorded.
- The covering letter (Appendix A) was revamped and reformatted to make it visually more interesting and to immediately highlight to respondents the short length of time it might take to fill in the survey. The Researcher tested the new survey instrument on ten new colleagues to obtain the average

amount of time it took to complete the questionnaire and to ensure the redrafted questionnaire had successfully responded to the pilot survey's flaws.

4.4 Population and Sample

The study's sample consisted of 400 randomly selected academics at ECU. The Researcher did not participate in this process. Approval was sought and granted for access to ECU's internal mailing list with the Researcher's supervisor controlling the random selection process.

4.5 Questionnaire

The final questionnaire consisted of four sections:

1. Demographic information;
2. General questions;
3. Questions to elicit Respondents' attitudes towards EJs; and
4. Questions to elicit Respondents' usage of EJs.

4.5.1 Section 1- Demographics

Respondents were asked to answer questions regarding their:

- Gender;
- Age;
- Amount of time since their last qualification was conferred;

- Job title;
- Faculty; and
- Approximate number of hours spent on research, teaching and preparation activities during an average week, during the semester.

4.5.2 Section 2- General Questions

Respondents were provided with a short definition of EJs. A couple of examples of EJs were provided for clarification and respondents were encouraged to provide comments and take as much room as they needed for their answers. Respondents were then asked ten general questions to discover:

- Their perception of their experience using electronic networks, such as the Internet;
- If they had attended an Internet training course, and if yes, when;
- If they personally subscribed to EJs, and if yes, how many;
- Their preference for reading EJ articles;
- If they had cited or submitted articles to EJs;
- Their intentions to cite or submit to EJs in the future;
- If they had submitted articles to scholarly, paper-based journals; and
- Their awareness of their own work being cited in EJs.

4.5.3 Section 3- Attitude

Respondent's attitudes towards EJs were elicited using fifteen questions and possible responses ranged along a five point scale ranging from strongly agree to strongly disagree.

4.5.4 Section 4- Usage

Eight questions sought to discover respondents' usage patterns of EJs. Possible responses using a five point scale ranging from always to never, were provided.

4.6 First Mailing of the Questionnaire

The first mail-out of the survey to the sample was conducted during the last few weeks of the second semester[19] in late 1999 to 400 academic staff. Respondents were asked to complete the survey as soon as possible, but were not given a cut-off date. The mail out contained:

- A cover letter and numbered questionnaire (Appendix B); and
- An envelope addressed to the Researcher's supervisor at ECU.

As questionnaires were returned, the numbered questionnaire was matched to the academics' name and the Researcher's supervisor crossed off their names from the list. The supervisor then forwarded unidentified batches of returned questionnaires to the Researcher's home. The supervisor did not look at the completed questionnaires, and the Researcher did not have access to any respondents' names to ensure respondents' anonymity.

4.7 Second Mailing of the Questionnaire

Due to the initial mail out being completed late in the second semester 1999,

[19] Second Semester at ECU was August to December 1999

the second mail-out was delayed until the beginning of the first semester[20] 2000. Non-respondents received a slightly different covering letter (Appendix C) with the same questionnaire using the method described in Section 4.6. Again, respondents were asked to complete the survey as soon as possible, but were not given a cut-off date.

4.8 Response Rate

At the conclusion of the two mail-outs the overall response rate reached fifty-two percent (n=207). Table 5 reveals the composition of the response rate according to individual faculties.

Table 5 Breakdown of Response Rate

Faculty	Frequency	Percentage
Communications, Health & Science	73	35.3
Community Services, Education and Social Sciences	71	34.3
Business & Public Management	37	17.9
WA Academy of Performing Arts	15	7.2
Other	11	5.3
Total	207	100

[20] First Semester 2000 was from February to June

4.9 Method of Analysis

The *SPSS* package was used to analyse the data collected to give descriptive statistics such as frequency and percentage, and applied to the hypotheses and research questions identified in Chapter 3. The results' margin of error was also investigated.

> Margin of error = 1 divided by the square root of the number of people in the sample (or sub-group) (Niles 1996b).

The results of each hypothesis and survey question was analysed using that sample's margin of error (the margin of error plus and minused from the original number). If the figures did not overlap the results were then used to test the hypothesis or research question being investigated. If the figures overlapped, the results were deemed to be insufficiently clear to make reasonable conclusions. The steps used to calculate and use the margin of error is illustrated in the following examples:

Example 1:

1. A sub-group of 73 respondents has a margin of error of 12 percent, using the margin of error formula:
   The square root of 73 equals 8.5440037
   1 ÷ 8.5440037 equals 0.1170406, rounded to 12 percent
2. The sub-group of 73 is divided into two further groupings (For example in a simple yes/no question).
3. 11 of the 73 sub-group chose 'Yes' which equals 15 percent of the sub-group's respondents.
4. Using the margin of error calculation, the 'Yes' respondents result ranges from a possible low of 3 percent to a possible high of 27 percent (15 percent plus and minus the 12 percent margin of error).

5. 62 of the 73 sub-group chose 'No' which equals 85 percent of the sub-group's respondents.
6. Using the margin of error calculation, the 'No' respondents result ranges from a possible low of 73 percent to a possible high of 97 percent (85 percent plus and minus the 12 percent margin of error).
7. As there is no overlap between the highest possible score for the 'Yes' respondents (27 percent) and the lowest possible score for the 'No' respondents (73 percent), it can be reasonably assumed that the results give a statistically significant, clear majority 'No' answer to the original question.

Example 2:

1. A sub-group of 73 respondents has a margin of error of 12 percent, using the margin of error formula:
   The square root of 73 equals 8.5440037
   1 ÷ 8.5440037 equals 0.1170406, rounded to 12 percent
2. The sub-group of 73 is divided into two further groupings (For example in a simple yes/no question).
3. 30 of the 73 sub-group chose 'Yes' which equals 41 percent of the sub-group's respondents.
4. Using the margin of error calculation, the 'Yes' respondents result ranges from a possible low of 29 percent to a possible high of 53 percent (41 percent plus and minus the 12 percent margin of error).
5. 43 of the 73 sub-group chose 'No' which equals 59 percent of the sub-group's respondents. [21]
6. Using the margin of error calculation, the 'No' respondents result ranges from a possible low of 47 percent to a possible high of 71 percent (59 percent plus and minus the 12 percent margin of error).
7. As there is an overlap between the highest possible score for the 'Yes' respondents (53 percent) and the lowest possible score for the 'No'

[21] It is noted that many research studies would claim a clear majority for 'no' respondents at this point.

respondents (47 percent), the results do not give a statistically valid 'No' answer to the original question. Caution would then be used in interpreting this result.

The margin of error formula gives a 95 percent confidence interval for its results and is derived from the standard deviation of the proportion of times that a sample's result is 'right', against a large number of samples (Niles, c.1996.a, b)

4.10 Validity and Reliability

Survey research was chosen for the reasons outlined in Section 4.2 *The Research Method* including Marsland et al.'s (2000) advice. Marsland et al.'s recommendation that sample survey research is suitable when the study's objective of obtaining statistically valid, quantitative data from which defensible inferences of the larger population could be made was closely aligned with this study's goal and as such was utilised to enhance the legitimacy of its results.

As outlined above, a draft questionnaire (Appendix A) was pre-tested on thirty members of MTU to discover potential flaws in the survey instrument. These flaws were considered for the final questionnaire and the redrafted questionnaire was re-tested on ten of the Researcher's colleagues to ensure the pilot survey's flaws were negated. No further flaws were identified. The final version of the questionnaire is provided in Appendix B.

With 207 responses, the survey received responses from 35 percent of ECU's total academic population. With such a large sampling, this increases the validity of its results significantly.

Heberlein and Baumgarter (cited Kiesler and Sproull, 1986) outlined that the average response rate from mail surveys usually falls within 48 to 61 percent. The

response rate for the present study (52 percent) falls within this range and is therefore satisfactory.

The survey received responses from 35 percent of the total ECU academic population. The demographics of respondents were examined (Tables 6 and 7) and it was discovered that the sample was closely aligned with the population of academics at ECU thereby limiting possible non-response bias.

Table 6 Comparison of Gender for ECU by Faculty Population and Sample

Gender	ECU Faculty Population[22]		Sample	
		Percentage		Percentage
Male	352	59	116	56
Female	244	41	91	44
Total	596	100	207	100

As Table 6 above illustrates, in 2000 ECU had 244 female (41 percent) and 352 male (59 percent) full-time and fractional full-time academic staff, totalling 596 academic staff. As such, ECU's population compares favourably with the sample's ratio of 44 percent female and 56 percent male academic staff, with the sample representing ECU's population within 3 percentage points.

[22] Source: Edith Cowan University, c. 2001b, Table 4.14 *2000 Full-time and Fractional Full-time Academic Staff by Level of Appointment, Highest Qualification Attained and Gender*, p. 187.

Table 7 Comparison of Faculty for ECU by Faculty Population and Sample

Faculty	ECU Faculty Population[23]		Sample	
		Percentage		Percentage
Communications, Health & Science	161	27.0	73	35.3
Community Services, Education and Social Sciences	192	32.2	71	34.3
Business & Public Management	126	21.1	37	17.9
WA Academy of Performing Arts	60	10.1	15	7.2
Other[24]	57	9.6	11	5.3
Total	596	100	207	100

Table 7 reveals that there were slightly larger differences in comparing ECU's faculty population to the sample, from just over 8 percent for the Communications, Health and Science Faculty to just over 2 percent for the Community Services, Education and Social Sciences Faculty. Table 7 also illustrates that the Faculties of Communications, Health and Science and Community Services, Education and Social Sciences were both slightly oversampled when compared to ECU's population. Additionally, the Faculties of Business and Public Management, the West Australian Academy of Performing Arts and the 'Other'[25] category were each marginally underrepresented in the sample. However, these variations are negligible and the sample is roughly proportionate to ECU's faculty population at the time of the survey.

As can be seen in Table 7 above, eleven respondents indicated 'Other' as their Faculty. Four respondents noted choosing 'other' indicated their Faculty as being

[23] Source: Edith Cowan University, c. 2001b, Table 4.09 *2000 Full-time and Fractional Full-time Staff by Faculty/Division and Current Classification,* p. 183.
[24] 'Other' includes the Faculty of Bunbury (35), and Divisional Staff (22) such as Vice Chancellery, Pro Vice Chancellery, etc.
[25] 'Other' includes the Faculty of Bunbury (35), and Divisional Staff (22) such as Vice Chancellery, Pro Vice Chancellery, etc.

Bunbury.

The ECU publication *Pocket Statistics – ECU statistics at a glance* (c. 2001a) lists FTE faculty teaching staff as being 776 and 747 for 1999 and 2000 respectively. However, another ECU publication *2000 Edith Cowan University StatsBook-on-the-Web* (c. 2001b) gives the conflicting number of FTE faculty staff as being 596 in 2000. The Researcher has been unable to discover the reason for this discrepancy and it is assumed that the figures are counting different definitions of 'faculty'. The Researcher has chosen to use the faculty figure of 596 in 2000 as the figure for analysis from the *2000 Edith Cowan University StatsBook-on-the-Web* (c. 2001b). This ECU publication is a much more rigorous statistical analysis of ECU faculty than the *Pocket Statistics* publication, giving greater confidence as to the figure's accuracy. Interestingly, the Researcher has also noted similar inconsistencies when describing other subjects in other ECU publications[26].

Demming (cited Denzin, 1978) identified thirteen factors that can adversely affect the usefulness of survey research. The factors that may influence the validity of the results in this research project include:

1. Variability in response. While controlling the time of day, or week, a respondent answers the questionnaire was beyond the power of the Researcher, it is assumed that by randomly sampling a large number of academics possible bias resulting from this will be negated;
2. Bias arising from the agency supporting the research being known. The knowledge that an ECU student conducted the survey may affect the willingness of respondents to co-operate, or they may have their own agenda (e.g. being philosophically opposed to new technology such as EJs and wanting that message to be conveyed to ECU's librarians). Again, it is

[26] For example the ECU publication *Pocket Statistics – ECU statistics at a glance* (c. 2001a) gives ECU's library's holdings (volumes) as being 717,949 and 783,148 for 1999 and 2000 respectively. However ECU's *2002 Annual Report: Statistics* (2003a) gave ECU's library's holdings (volumes) as being 625,458 and 787,487 for 1999 and 2000 respectively.

assumed that the large number of respondents will diffuse any statistical impact;

3. Imperfections in the design of the questionnaire, such as lack of clarity in directions or terms. By pre-testing the questionnaire, bias resulting from ambiguous questions or terms, or faults in the design of the questionnaire became obvious and resulted in changes which were tested again to ensure that the final questionnaire contained minimal flaws;
4. Changes that take place in the population or sample before analysis is completed. The survey was conducted over two semesters, in two different academic years in late 1999 and early 2000. A change in the population's attitudes towards EJs at that time was likely to be minimal. However, as a number of years has elapsed from the time of the research study and its analysis it should be expected that changes may have occurred in ECU's academics' attitudes and usage patterns towards EJs;
5. Errors of processing, coding, editing and tabulating were eliminated by:
   - Using the SPSS software;
   - Using an assistant to double check the Researcher's input; and
   - Checking that when tables were created for each question, the numbers equalled 207. This may not have been possible if the numbers were entered incorrectly; and
6. Errors in interpretation through either the respondent misunderstanding the questions, or the researcher's own personal bias coming into the interpretation process. By pre-testing the questionnaire, bias resulting from respondents misunderstanding the questions became clear and was eliminated. The Researcher's own personal bias is examined in Section 4.10.1.

By using ECU's internal mail it was assumed that bias from the delivery method would also be eliminated. As noted in Section 4.2, if electronic mail had been used, this may have biased results in favour of academics that are comfortable with using e-mail or the Internet and, by extension, possibly EJs.

Verification of the findings was accomplished by examining the relationship between questions 33 (*I read academic EJs*), 34 (*I search academic EJs when researching a new topic*) and 35 (*I read academic EJs to keep in touch with topics associated with areas in which I teach &/or have qualifications*). As the questions were similar in nature, and the negative results (answer equals never) were comparable (21.3 percent, 21.3 percent and 22.7 percent respectively) it follows that respondents answered the survey's questions consistently.

4.10.1 The Researcher's Views

The Researcher has actively used EJs for many years. EJs were found to be particularly useful when the Researcher was living in a remote rural town, where access to print academic EJs necessitated travelling hundreds of kilometres to the State's capital city. On the negative side Internet access was slow (via 24 kilobyte per second modem) and not entirely reliable and the Researcher possessed a small monitor (twelve inch) which led to considerable eye strain when reading articles on-screen.

When the Researcher moved from the remote rural town to Australia's capital city, where there were a number of large university libraries close by, academic EJs still provided superior availability and accessibility over print journals. Access to EJs did not necessitate a drive to frustratingly full, costly university car parks only to find needed journal issues were unavailable, or sought after articles ripped out of their journals. Freely available EJ articles were convenient, available at all hours, on all days, with their only costs being for Internet access, paper and ink.

The Researcher is philosophically neutral towards EJs. The Researcher is able to recognise their benefits and their disadvantages and acknowledges their value in conducting the literature review for this thesis. However, the Researcher does not view them as a panacea to the serials crisis and before beginning this research study believed EJs may not be universally suitable and may indeed alienate some library clients who

either enjoyed the experience of reading paper journals, were not comfortable using the Internet, or lacked the necessary skills to locate EJs.

As Logue (2003) has stated, librarians "have historically been early adopters of technology". Librarians' ability to recognise the potential offered by new technologies or services, such as EJs, has indeed been one of the hallmarks of the profession. However, the Researcher is steadfast in believing that librarians should consult with clients and test the usability of EJs before reducing or eliminating paper journals from their collections.

4.11 Limitations

4.11.1 Limitation of Research Methodology

The information reported in this study was obtained directly from the respondents. It should be noted however, there is no *physical* evidence (library records, logs etc) to corroborate the results.

As noted in Sections 4.6 and 4.7 the survey was conducted over two semesters, in two academic years during late 1999 and early 2000. While it has been assumed that changes in the population during that time were likely to have been minimal, it would have been ideal to complete the survey during one semester, when changes to the population would have been less.

4.12 Ethical Issues

Covering letters (Appendices B and C) were sent to each subject along with a

copy of the questionnaire[27]. No form of coercion was used to make subjects fill out the questionnaire. In this way, each subject's participation was completely voluntary.

The covering letter clearly stated what the purpose of the survey was, who was conducting it, and how the collected data would be used. This ensured each subject was able to give informed consent whether or not they wished to participate. By not returning the questionnaires the test subjects were completely free not to participate.

The guarantee of confidentiality and privacy was explicitly stated in the covering letter and if, during the analysis of the data, any individual's response could be identified, then that individual's data would have been discarded. This, however, did not eventuate.

While the questionnaires were coded with a number, this was only to ensure that respondents to the first mail-out did not receive the follow-up reminder letter. Once the second mail-out pf the questionnaire was posted, the list of names was destroyed.

In this way it was ensured there could be no adverse affects on any individual choosing to respond to the questionnaire.

It was also assumed there would be no negative consequences to ECU. It was anticipated that the results of the survey would not be controversial, but will serve to extend research already conducted in this area and provide informative data useful to librarians in academic institutions and to other information professionals.

[27] NB: The Covering letter at Appendix C was only received by non-respondents to the initial mail-out.

CHAPTER 5

RESEARCH HYPOTHESES RESULTS, ANALYSIS AND DISCUSSION

Sections 3.3.1 to 3.3.6 outlined the six research hypotheses explored by this study. The analysis and discussion reported in this Chapter was conducted on the 207 responses received by the Researcher. Chapter 6 will present the survey results in relation to the twenty research questions posed in Section 3.3.7.

In order to identify different factors that may influence faculty members' usage of EJs, analysis was conducted on six major factors, including:

1. Faculty;
2. Gender;
3. Age;
4. Amount of time since last qualification;
5. Amount of research activity; and
6. Level of Internet experience.

Each of the above factors was cross-tabulated with nine significant questions from the survey to enable trends to be highlighted and analysed. The nine significant questions or statements for endorsement or rejection were:

1. Do you personally subscribe (free or paid) to any academic electronic journals?
2. Have you cited articles from academic electronic journals in your own work?
3. Would you cite articles from academic electronic journals in the future?

4. In the years 1994 to1998 have you submitted articles to scholarly electronic journals?
5. At present, do you intend to submit your own work for publication in academic electronic journals in the future?
6. I believe most academic electronic journals have poor or inconsistent quality of articles;
7. Publishing in academic electronic journals does not contribute to promotion or tenure;
8. I search academic electronic journals when researching a new topic; and
9. I read academic electronic journals to keep in touch with topics associated with areas in which I teach and/or have qualifications.

The questions above were selected from the survey as together, they give a 'snapshot' of both current usage and intended future usage of EJs by Faculty at ECU and are indicative of Faculty members' opinions regarding EJs. When cross-tabulated with the six factors listed above, factors that may influence whether or not an individual Faculty member may use EJs should become clear.

Three factors (Age, Research Activity and Level of Internet Experience) were cross-tabulated with an additional question (In the years 1994-1998 have you submitted articles to scholarly, paper-based journals?) to gain further insight into Respondents' behaviour.

Differences between factor sub-groups (male versus female etc) were analysed using the margin of error statistical formula (Niles, c.1996b):

> Margin of error = 1 divided by the square root of the number of people in the sample (or sub-group).

The results of each sub-group were analysed using that sub-group of the sample's margin of error (the margin of error plus and minused from the original

number). If the figures did not overlap the results were then used to test the hypothesis being investigated. If the figures overlapped, the results were deemed to be insufficiently clear to make reasonable conclusions. The steps used to calculate and use the margin of error is outlined in Section 4.9.

The results for each question in the survey are presented and analysed in Chapter 6.

5.1 Differences in the Usage of EJs by Faculty

The literature review identified there were significant differences in the way different Faculties used EJs, with Speier et al.'s (1999) and Tenopir and King's (cited Bonthron et al., 2003) studies supporting the hypothesis outlined in Section 3.3.1 that faculty in ECU's Communications, Health and Science and Business and Public Management Faculties would be the heaviest users of EJs at ECU. Table 8 below presents the margins of error that were calculated and used to analyse Tables 9 to 17.

Table 8 Margins of Error for Faculty

Faculty	Sample Size (Percent)	Margin of Error (percent)
Communications, Health & Science	73 (35)	12
Community Services, Education and Social Sciences	71 (34)	12
Business & Public Management	37 (18)	16
WA Academy of Performing Arts	15 (7)	26
Other[28]	11 (6)	
Total	207 (100)	

Tables 9 to 17 generally do not support the hypothesis that academics in ECU's Communications, Health and Science and Business and Public Management Faculties are

the heaviest users of EJs at ECU.

Table 9 below clearly demonstrates that at the time the survey was conducted each Faculty tended not to have personal subscriptions to EJs. As the margin of error varied from 26 plus or minus percentage points with the WA Academy of Performing Arts to 12 plus or minus percentage points with the Faculties of Communications, Health and Science and Community Services, Education and Social Sciences, no conclusion could be reached as to which Faculty is the most or least likely to be disposed to having personal subscriptions to EJs. However, *all* the Faculties have a clear majority of academics not having personal subscriptions to EJs and as such does not support the hypothesis outlined above.

Table 9 Faculty Cross Tabulated with Personal Subscriptions to EJs (Questions 5 and 10)

	Personal Subscriptions to EJs			Total (percent)
	Yes (percent)[29]	No (percent)	Depends (percent)	
Faculty				
Communications, Health & Science	11 (15)	62 (85)	0 (0)	73 (100)
Community Services, Education & Social Sciences	11 (15)	60 (85)	0 (0)	71 (100)
Business & Public Management	9 (24)	28 (76)	0 (0)	37 (100)
WA Academy of Performing Arts	3 (20)	12 (80)	0 (0)	15 (100)
Other[30]	1 (1)	10 (91)	0 (0)	11 (100)
Total	35	172	0	207

[28] The results from this sub-group were not analysed.

[29] Note: All percentages in Tables 9 to 17 are rounded to the nearest whole number, for presentation in the tables. While the unrounded figures total 100 percent, the rounding process may affect the total. Where this happens and the rounded figures total more or less than 100 percent, this will be noted and the figure in the last column rounded to 100 percent.

Table 10 below does not give as clear a result as Table 9 above. At first glance, the results appear to indicate that at the time the survey was conducted a majority of academics in all Faculties, with the exception of Business & Public Management, had not cited EJ articles in their own work. However, once the margin of error was considered the results for the Faculties of Communications, Health and Science, Business and Public Management and the WA Academy of Performing Arts do not support any conclusion. However, the results for the Community Services, Education and Social Sciences Faculty does indicate that its academics have generally not cited EJ articles in their own work. As such, the results from this analysis does not clearly support or disprove the hypothesis outlined above. This question would benefit from being re-tested on a larger sample to obtain more conclusive results.

Table 10 Faculty Cross Tabulated with Citing EJ Articles in Own Work (Questions 5 and 12)

	Citing EJ Articles in Own Work			Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	
Faculty				
Communications, Health & Science	35 (48)	38 (52)	0 (0)	73 (100)
Community Services, Education & Social Sciences	23 (32)	48 (68)	0 (0)	71 (100)
Business & Public Management	19 (51)	18 (49)	0 (0)	37 (100)
WA Academy of Performing Arts	4 (27)	11 (73)	0 (0)	15 (100)
Other	5 (45)	6 (55)	0 (0)	11 (100)
Total	86	121	0	207

[30] 'Other' includes the Faculty Bunbury. Four respondents indicated their faculty as being 'Bunbury'. At the time the survey was used, the Researcher was not aware that Bunbury was classified as a Faculty in addition to being a campus. However, as not all respondents specified which Faculty they belonged to if they ticked 'other', results from this sub-group were not analysed.

Table 11 below clearly demonstrates that at the time the survey was conducted respondents from three of the four Faculties all intended to cite EJ articles in their work in the future. Unfortunately, once the sub-group's margin of error was considered for the WA Academy of Performing Arts, its results were not sufficiently clear to either support or refute the hypothesis. However, the results from the other three Faculties do not support the hypothesis outlined above that academics in ECU's Communications, Health and Science and Business and Public Management Faculties would be the heaviest users of EJs.

Table 11 Faculty Cross Tabulated with Citing EJ Articles in the Future (Questions 5 and 13)

	Citing EJ Articles in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer (percent)	
Faculty					
Communications, Health & Science	60 (82)	2 (3)	11 (15)	0 (0)	73 (100)
Community Services, Education & Social Sciences	55 (77)	0 (0)	15 (21)	1 (1)	71 (100[31])
Business & Public Management	31 (84)	1 (3)	5 (14)	0 (0)	37 (100[32])
WA Academy of Performing Arts	6 (40)	2 (13)	7 (47)	0 (0)	15 (100)
Other	10 (90)	1 (9)	0 (0)	0 (0)	11 (100)
Total	162	6	38	1	207

[31] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.
[32] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

The results from Table 12 below also do not support the hypothesis that academics in ECU's Communications, Health and Science and Business and Public Management Faculties should be the heaviest users of EJs at ECU. If this hypothesis were to be supported, the results should show that these two Faculties were more likely to have submitted articles to EJs then the other two Faculties. However, Table 12 demonstrates that the vast majority of academics from every Faculty at ECU had not submitted articles to EJs in the years 1994 to 1998.

Table 12 Faculty Cross Tabulated with Submission of Articles to EJs in the Years 1994 to 1998 (Questions 5 and 15)

	Submission Of Articles To EJs		**Total (percent)**
	Yes (percent)	**No (percent)**	
Faculty			
Communications, Health & Science	10 (14)	63 (86)	73 (100)
Faculty of Community Services, Education & Social Sciences	6 (8)	65 (92)	71 (100)
Faculty of Business & Public Management	3 (8)	34 (92)	37 (100)
WA Academy of Performing Arts	0 (0)	15 (100)	15 (100)
Other	1 (9)	10 (91)	11 (100)
Total	20	187	207

Unfortunately, the results from Table 13 below are not sufficiently clear to make a valid inference as, once the margin of error was considered, the results from the different choices (yes, no, depends) overlap. This question would benefit from being re-tested on a larger sample to obtain more conclusive results. However it is an interesting

result, given that Table 12 above shows that generally academics at ECU are quite willing to cite articles from EJs in the future, yet there is no clear willingness to submit articles to them in the future. Section 6.15 discusses this issue in greater detail.

Table 13 Faculty Cross Tabulated with Intention to Submit Articles to EJs in the Future (Questions 5 and 17)

	Submission To EJs In The Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer (percent)	
Faculty					
Communications, Health & Science	17 (23)	32 (44)	24 (33)	0 (0)	73 (100)
Community Services, Education & Social Sciences	19 (27)	29 (41)	22 (31)	1 (1)	71 (100[33])
Business & Public Management	13 (35)	13 (35)	10 (27)	1 (3)	37 (100)
WA Academy of Performing Arts	4 (27)	7 (47)	4 (27)	0 (0)	15 (100[34])
Other	5 (45)	3 (27)	2 (18)	1 (9)	11 (100[35])
Total	58	84	62	3	207

Again, Table 14 below does not support the hypothesis outlined above with a majority of those surveyed in each Faculty either being neutral or having no opinion regarding EJs having poor or inconsistent quality articles. Once the margin of error was considered for the yes and no responses there were no clear results whether faculty tended to agree or disagree with the statement at the time the survey was conducted.

[33] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.
[34] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[35] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

However it is an interesting result, given that Table 13 above demonstrates that generally academics at ECU believe they will be willing to cite articles from EJs in the future. Given the results in Table 13, it is interesting to note that ECU academics did not generally disagree with the statement that most EJs have poor or inconsistent quality articles. This may of course indicate that ECU Academics may believe that the quality of EJ articles will improve in the future.

Table 14 Faculty Cross Tabulated with Belief that Most EJs have Poor or Inconsistent Quality Articles (Questions 5 and 25)

	EJs Have Poor Or Inconsistent Quality Articles						Total (Percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No-opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer (percent)	
Faculty							
Communications, Health & Science	1 (1)	11 (15)	42 (58)	18 (25)	0 (0)	1 (1)	73 (100)
Community Services, Education & Social Sciences	3 (4)	8 (11)	49 (69)	10 (14)	1 (1)	0 (0)	71 (100[36])
Business & Public Management	1 (3)	6 (16)	22 (59)	8 (22)	0 (0)	0 (0)	37 (100)
WA Academy of Performing Arts	2 (13)	2 (13)	10 (67)	1 (7)	0 (0)	0 (0)	15 (100)
Other	0 (0)	0 (0)	9 (83)	2 (18)	0 (0)	0 (0)	11 (100)
Total	7	27	132	39	1	1	207

[36] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

Unfortunately, after considering the results within the margin of error formula, the results in Table 15 below are not sufficiently clear to draw valid inferences. However, the results may indicate that all ECU's Faculties may tend to be neutral or have no opinion at the time the survey was conducted, regarding whether publishing in EJs contributes to promotion and tenure and so may not support the hypothesis outlined earlier. This question would benefit from being re-tested on a larger sample to reduce the margin of error and obtain more conclusive results.

Table 15 Faculty Cross Tabulated with Belief that Publishing in EJs Does Not Contribute to Promotion or Tenure (Questions 5 and 29)

	Publishing In EJs Does Not Contribute To Promotion Or Tenure						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer (percent)	
Faculty							
Communications, Health & Science	1 (1)	13 (18)	32 (44)	24 (33)	2 (3)	1 (1)	73 (100)
Community Services, Education & Social Sciences	0 (0)	14 (20)	35 (49)	19 (27)	2 (3)	1 (1)	71 (100)
Business & Public Management	0 (0)	10 (27)	17 (46)	10 (27)	0 (0)	0 (0)	37 (100)
WA Academy of Performing Arts	0 (0)	2 (13)	8 (53)	4 (27)	1 (1)	0 (0)	15 (100)
Other	0 (0)	0 (0)	7 (64)	3 (27)	1 (9)	0 (0)	11 (100)
Total	1	39	99	60	6	2	207

Similarly, Table 16's results below are also insufficiently clear to derive legitimate inferences and should be re-tested on a larger sample to reduce the margin of

error and obtain more conclusive results. However, it is noted that in general most respondents chose 'rarely' or 'never', which may indicate that at the time the survey was conducted most of the Faculties, with the possible exception of the Faculty of Business and Public Management, rarely or never used EJs when researching a new topic. When the 16 percent margin of error is applied to the Faculty of Business and Public Management's results[37] it is not possible to state conclusively that it was an exception. As such, while the results from Table 16 below not support the hypothesis stated above its results are not conclusive and would benefit from being re-tested on a larger sample.

Table 16 Faculty Cross Tabulated with Usage of EJs When Researching a New Topic (Questions 5 and 34)

	Usage Of EJs When Researching A New Topic						Total (percent)
	Always (percent)	Usually (percent)	Some of the time (percent)	Rarely (percent)	Never (percent)	No answer (percent)	
Faculty							
Communications, Health & Science	10 (14)	15 (21)	16 (22)	16 (22)	16 (22)	0 (0)	73 (100[38])
Community Services, Education & Social Sciences	2 (3)	14 (20)	16 (23)	20 (28)	19 (27)	0 (0)	71 (100[39])
Business & Public Management	3 (8)	14 (38)	9 (24)	6 (16)	4 (11)	1 (3)	37 (100)
WA Academy of Performing Arts	0 (0)	2 (13)	4 (27)	5 (33)	4 (27)	0 (0)	15 (100)
Other	2 (18)	0 (0)	5 (45)	3 (27)	1 (9)	0 (0)	11 (100[40])
Total	17	45	50	50	44	1	207

[37] When the results for the 'Always' and 'Usually' are aggregated they come to 46 percent. Applying the sub-group's margin of error of plus or minus 16 percent gives results ranging from a possible high of 62 to a possible low of 30. The 'Rarely' and 'Never' results scored 27 percent when aggregated. Again when the margin of error is applied, its results range from a possible high of 43 to a possible low of 11 percent. As the scores overlap it is not valid to state conclusively that this faculty is an exception.

[38] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

[39] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

[40] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

The results for two Faculties in Table 17 below indicate that at the time the survey was conducted a majority of academics in the Communications, Health and Science and Community Services, Education and Social Sciences Faculties rarely or never used EJs to keep in touch with the topics in which they taught and/or had qualifications. As such, this result does not support the hypothesis outlined above. Unfortunately, the results were insufficiently clear, once the margin of error was considered, to draw reasonable conclusions for the Faculties of Business and Public Management and the WA Academy of Performing Arts.

Table 17 Faculty Cross Tabulated with Reading EJs to Keep in Touch with Topics Associated with Areas in which the Academic Teaches &/Or has Qualifications (Questions 5 and 35)

	Usage of EJs to keep in Touch with Topics Associated with Areas in which the Academic Teaches &/or has Qualifications						Total (percent)
	Always (percent)	Usually (percent)	Some of the time (percent)	Rarely (percent)	Never (percent)	No answer (percent)	
Faculty							
Communications, Health & Science	5 (7)	10 (14)	21 (29)	20 (28)	17 (23)	0 (0)	73 (100[41])
Community Services, Education & Social Sciences	4 (6)	5 (7)	25 (35)	17 (24)	20 (28)	0 (0)	71 (100)
Business & Public Management	1 (3)	6 (16)	18 (49)	7 (20)	5 (14)	0 (0)	37 (100[42])
WA Academy of Performing Arts	1 (7)	0 (0)	6 (40)	4 (27)	3 (20)	1 (3)	15 (100[43])
Other	2 (18)	1 (9)	2 (18)	4 (36)	2 (18)	0 (0)	11 (100[44])
Total	13	22	72	52	47	1	207

[41] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[42] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

The hypothesis that faculty in ECU's Communications, Health and Science and Business and Public Management Faculties would be the heaviest users of EJs at ECU was clearly not supported by the current study's results. While some of the analysis was inclusive due to the small sub-group sample numbers and resulting large margins of error, there was sufficient evidence to demonstrate that membership of a particular Faculty does not appear to be an influencing factor on the usage of EJs at ECU.

It is an interesting outcome of the present study that each Faculty at ECU answered the survey remarkably similarly. One would normally expect differences by Faculty to be quite discernable, indeed it was an assumption made by the Researcher and noted in Section 3.4. However, the results appear to discredit this assumption and this result may in part be due to the fact that within each faculty at ECU, there are a number of different schools, or disciplines. One example of this is the Faculty of Communications, Health and Science, which contained at the time of the study the four individual schools of:

- Communications and Multimedia;
- Computer and Information Science;
- Natural Sciences; and
- Nursing and Public Health.

When the results of academics from ECU's individual schools were aggregated into the larger Faculties, it may have 'blended' the results of the survey. This may mean that while the hypothesis proposed in Section 3.3.1 has not been supported by the results of this study there might still be differences in the usage of EJs by different schools within individual Faculties.

[43] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[44] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

Another reason why the current study's results did not support the earlier research by Speier et al. (1999) and Tenopir and King (cited Bonthron et al., 2003), might be due to different 'schools' or disciplines being aggregated under similar Faculty names to those canvassed in earlier studies and so preventing the 'apples' of previous studies being compared with 'apples' in the present study.

Another possible reason could be due to local factors influencing the result, such as those outlined in Section 3.2 above. It was noted that at the time the survey was conducted, ECU lacked formal Internet training for academics and EJs were not discoverable through the library's catalogue until after the survey was completed. These local factors may have similarly disadvantaged all ECU academics equally and lead to the similar results across the different Faculties.

5.2 Differences in the Usage of EJs by Gender

The literature review did not expose significant differences in the way the two genders used EJs. Applebee et al.'s (1997) results contrast with Majid and Abazova's (1999) study. Applebee et al. found that males were the heavier users of the WWW while Majid and Abazova found that female respondents were heavier users of the Internet. This study proposed the hypothesis that there were differences, according to gender, in who were the heaviest users of EJs and that males would demonstrate a greater interest, awareness of or disposition to use EJs in the future.

Table 18 presents the margins of error that were calculated and used to analyse Tables 19 to 27.

Table 18 Margins of Error for Gender

Gender	Sample Size (percent)	Margin of Error (percent)
Male	116 (56)	9
Female	91 (44)	10
Total	207 (100)	

Tables 19 to 27 generally demonstrate that gender was not an influencing factor on whether or not an academic at ECU will use EJs.

Table 19 below reveals that both male and female faculty at ECU have not held personal subscriptions to EJs, with the proportion of those who held subscriptions to those who have not held subscriptions being within a similar range across the two gender groups.

Table 19 Gender Cross Tabulated with Personal Subscriptions to EJs (Questions 1 and 10)

	Personal Subscriptions to EJs		Total (Percent)
	Yes (percent)[45]	No (percent)	
Gender			
Male	23 (20)	93 (80)	116 (100)
Female	12 (13)	79 (87)	91 (100)
Total	35	172	207

[45] Note: All percentages in Tables 19 to 27 are rounded to the nearest whole number for presentation in the tables. While the unrounded figures total 100 percent, the rounding process may affect the total. Where this happens and the rounded figures total more or less than 100 percent, this will be noted and the figure in the last column rounded to 100 percent.

Table 20 below illustrates that male academics at ECU, at the time the survey was conducted, had overwhelmingly not cited EJs in their own work. Unfortunately, once the margin of error was considered, the result for female academics was not conclusive and no inferences could be made from the result. As such, Table 20 is not able to demonstrate any difference, according to gender, in the usage of EJs by ECU academics. This question would benefit from being re-tested on a larger sample to gain more conclusive results.

Table 20 Gender Cross Tabulated with Citing EJ Articles in Own Work (Questions 1 and 12)

	Citing EJ Articles in Own Work		**Total (percent)**
	Yes (Percent)	**No (Percent)**	
Gender			
Male	44 (38)	72 (62)	116 (100)
Female	42 (46)	49 (54)	91 (100)
Total	86	121	207

Table 21 below however, clearly demonstrates that at the time the survey was conducted the majority of both male and female academics intended to cite EJ articles in the future. The 'No' response for both genders was also very low and the 'Depends' response was also closely consistent across the two genders. Therefore, it does not appear that gender appears to be a factor influencing whether or not ECU's academics will or will not cite EJ articles in the future.

Table 21 Gender Cross Tabulated with Citing EJ Articles in the Future (Questions 1 and 13)

	Citing EJ Articles in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No answer (percent)	
Gender					
Male	88 (76)	5 (4)	23 (20)	0 (0)	116 (100)
Female	74 (81)	1 (1)	15 (16)	1 (1)	91 (100[46])
Total	162	6	38	1	207

Table 22 below also demonstrates that, at the time the survey was conducted, both genders had fairly consistently *not* submitted articles to EJs during 1994 to 1998, again suggesting that gender was not an influencing factor affecting the willingness of an ECU academic to submit an article to an EJ.

Table 22 Gender Cross Tabulated with Submission of Articles to EJs in the Years 1994 to 1998 (Questions 1 and 15)

	Submission of Articles to EJs		Total (percent)
	Yes (Percent)	No (percent)	
Gender			
Male	13 (11)	103 (89)	116 (100)
Female	7 (8)	84 (92)	91 (100)
Total	20	187	207

At the time the survey was conducted, males had a demonstrable intention to *not* submit articles in the future to EJs, as can be seen in Table 23 below, with a similar range of male respondents either intending to submit or feeling that whether they

[46] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

submitted articles or not was dependent on other factors[47]. Once the margin of error was considered, the results were insufficiently clear to make a reasonable interpretation of the female respondents' data. As such, this question would benefit from being re-tested on a larger sample to obtain more conclusive results.

However, it is interesting to note that the results for ECU academic females is quite evenly split over the three choices provided, with more choosing 'Depends' than their male colleagues. This may indicate that ECU academic females are more flexible in their approach to EJs and more willing to consider them – 'depending' on certain circumstances.

Table 23 Gender Cross Tabulated with Intention to Submit Articles to EJs in the Future (Questions 1 and 17)

	Submission to EJs in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No answer (percent)	
Gender					
Male	33 (28)	54 (47)	28 (24)	1 (1)	116 (100)
Female	25 (27)	30 (33)	34 (37)	2 (2)	91 (100[48])
Total	58	84	62	3	207

Gender also does not appear to be a factor influencing an academics' belief at the time the survey was conducted that most EJs had poor or inconsistent quality articles as shown in Table 24 below. The majorities of both males and females were either neutral or had no opinion on the issue. Interestingly, when the margin of error was considered, both genders were also closely aligned in either agreeing, or strongly agreeing; or disagreeing or strongly disagreeing with the statement. As such, gender did not appear to influence an academic's opinion regarding the quality of EJ articles.

[47] Factors influencing the 'Depends' response is discussed in more detail in Section 6.17.
[48] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

Table 24 Gender Cross Tabulated with Belief that Most EJs have Poor Or Inconsistent Quality Articles (Questions 1 and 25)

	EJs have Poor or Inconsistent Quality Articles						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer (percent)	
Gender							
Male	7 (6)	14 (12)	77 (66)	17 (15)	0 (0)	1 (1)	116 (100)
Female	0 (0)	13 (14)	55 (60)	22 (24)	1 (1)	0 (0)	91 (100[49])
Total	7	27	132	39	1	1	207

Table 25 below also appears to demonstrate that again, gender does not appear to be a factor at the time the survey was conducted influencing faculty's belief that publishing in EJs does not contribute to promotion and tenure. This particular outcome is interesting given the Commonwealth Department of Education, Science and Training's policy (Edith Cowan University, 2003d), that paper publishing does not earn more RAI points than publishing in EJs. This may mean that while ECU faculty may have understood that with an article published in an EJ they can earn RAI points and so gain access to research funds, they may have believed that publishing in EJs lacked status which may influence promotion and tenure decisions.

[49] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

Table 25 Gender Cross Tabulated with Belief that Publishing in EJs Does Not Contribute to Promotion or Tenure (Questions 1 and 29)

	Publishing in EJs does not Contribute to Promotion or Tenure						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer (percent)	
Gender							
Male	0 (0)	22 (19)	58 (50)	32 (28)	3 (3)	1 (1)	116 (100[50])
Female	1 (1)	17 (19)	41 (45)	28 (31)	3 (3)	1 (1)	91 (100)
Total	1	39	99	60	6	2	207

Males had a demonstrable behaviour at the time the survey was conducted of *not* using EJs when researching new topics, as can be seen in Table 26 below. When the figures for male respondents 'Rarely' and 'Never' responses are aggregated (equalling 50 percent of male respondents) this easily outranks male respondents who used EJs when researching a new topic and chose the 'Always' or 'Usually' responses (aggregated to 27 percent of male respondents). Unfortunately, female responses were more evenly spread, giving results that once the margin of error was considered, were unclear and it was not possible to make reasonable inferences as to whether gender was an influencing factor on their usage of EJs when researching a new topic. This question would benefit from being re-tested on a larger sample to gain more conclusive results.

However, while the results for female ECU academics may not be statistically significant, it is important to note that considerable numbers of both genders either never or rarely consult EJs when researching a new topic. This is a result worthy of investigation by ECU's librarians.

[50] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

Table 26 **Gender Cross Tabulated with Usage of EJs when Researching a New Topic (Questions 1 and 34)**

	Usage of EJs when Researching a New Topic						Total (percent)
	Always (percent)	Usually (percent)	Some of the time (percent)	Rarely (percent)	Never (percent)	No answer (percent)	
Gender							
Male	7 (6)	24 (21)	27 (23)	30 (26)	28 (24)	0 (0)	116 (100)
Female	10 (11)	21 (23)	23 (25)	20 (22)	16 (18)	1 (1)	91 (100)
Total	17	45	50	50	44	1	207

Table 27 below again demonstrates that gender did not appear to be an influencing factor on whether or not an academic at ECU used EJs to keep in touch with areas in which they taught and/or had qualifications. Both males and females surveyed either 'rarely' or 'never' used EJs for this purpose.

Table 27 **Gender Cross Tabulated with Reading EJs to Keep in Touch with Topics Associated with Areas in which the Academic Teaches &/Or has Qualifications (Questions 1 and 35)**

	Usage of EJs to keep in Touch with Topics Associated with Areas in which the Academic Teaches &/or has Qualifications						Total (percent)
	Always (percent)	Usually (percent)	Some of the time (percent)	Rarely (percent)	Never (percent)	No answer (percent)	
Gender							
Male	7 (6)	12 (10)	45 (39)	25 (22)	27 (23)	0 (0)	116 (100)
Female	6 (7)	10 (11)	27 (30)	27 (30)	20 (22)	1 (1)	91 (100[51])
Total	13	22	72	52	47	1	207

[51] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

The study set out to test a hypothesis that gender was a factor influencing whether or not an academic was disposed to using EJs with males being heavier users. Tables 19 to 27 provide sufficient evidence to demonstrate that, at the time of this study, gender was not a factor influencing whether or not an academic was likely to, or not, use EJs or have a demonstrable greater interest in them.

5.3 Differences in the Usage of EJs by Age

The literature review suggested that age is an important factor influencing whether or not faculty would be willing to use EJs. Tomney and Burton's (1998) study was supported by Speier et al.'s (1999) study, with both indicating that younger academics would be more inclined to use EJs.

Therefore, this study investigated the hypothesis that younger faculty in ECU would be the heaviest users of EJs and would demonstrate a greater interest, awareness of, or disposition to use EJs in the future than 'older' ECU faculty.

Table 28 presents the margins of error that were calculated and used to analyse Tables 29 to 38.

Table 28 Margins of Error for Age

Age	Sample Size (percent)	Margin of Error (percent)
20-30	8 (4)	35
31-40	30 (14)	18
41-50	82 (40)	11
51-60	70 (34)	12
61 and over	15 (7)	26
No Answer[52]	2 (1)	
Total	207 (100)	

Once analysed, Tables 29 to 38 generally do not support the hypothesis that younger faculty in ECU at the time the survey was conducted had a greater interest, awareness of, or disposition to use EJs in the future than 'older' ECU faculty. Instead, the results indicated that age was not a factor influencing the usage of EJs at ECU.

Table 29 below clearly demonstrates that at the time the survey was conducted age was *not* a factor influencing whether an academic held a personal subscription to an EJ, with the proportion of those who held subscriptions to EJs being similar to those who did not hold EJs subscriptions, across the five age sub-groups. Interestingly, Table 29 illustrates that the youngest sub-group in ECU, those between 20 to 30 years of age did not hold any personal subscriptions to EJs, while the oldest sub-group, those 61 years of age and over, had 13 percent of respondents who held personal subscriptions to EJs. This directly contradicts the proposed hypothesis that younger faculty in ECU would be the heaviest users of EJs and would demonstrate a greater interest, awareness of, or disposition to use EJs in the future than 'older' ECU faculty.

[52] The results for this sub-group were not analysed.

Table 29 Age Cross Tabulated with Personal Subscriptions to EJs (Questions 2 and 10)

	Personal Subscriptions to EJs			Total (percent)
	Yes (percent)[53]	No (percent)	Depends (percent)	
Age				
20-30	0 (0)	8 (100)	0 (0)	8 (100)
31-40	6 (20)	24 (80)	0 (0)	30 (100)
41-50	14 (17)	68 (83)	0 (0)	82 (100)
51-60	13 (19)	57 (81)	0 (0)	70 (100)
61 and over	2 (13)	13 (87)	0 (0)	15 (100)
No answer	0 (0)	2 (100)	0 (0)	2 (100)
Total	35	172	0 (0)	207

Respondents 61 years of age and over had consistently *not* cited EJs in their own work at the time the survey was conducted, as shown in Table 30 below.

Unfortunately, there is insufficient data to enable a meaningful interpretation of the data for the other sub-groups. Ostensibly, it may appear that all sub-groups had not cited EJs in their own work, but once the margin of error was considered, this interpretation was not supported and needs further testing on a larger sample to gain more conclusive data.

[53] Note: All percentages in Tables 29 to 38 are rounded to the nearest whole number for presentation in the tables. While the unrounded figures total 100 percent, the rounding process may affect the total. Where this happens and the rounded figures total more or less than 100 percent, this will be noted and the figure in the last column rounded to 100 percent.

Table 30 Age Cross Tabulated with Citing EJ Articles in Own Work (Questions 2 and 12)

	Citing EJ Articles in Own Work			Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	
Age				
20-30	3 (38)	5 (63)	0 (0)	8 (100[54])
31-40	10 (33)	19 (63)	1 (3)	30 (100[55])
41-50	37 (45)	45 (55)	0 (0)	82 (100)
51-60	32 (46)	37 (53)	1 (1)	70 (100)
61 and over	3 (20)	12 (80)	0 (0)	15 (100)
No answer	1 (50)	1 (50)	0 (0)	2 (100)
Total	86	119	2	207

Table 31 below decisively establishes that three of the age sub-groups *did* intend to cite EJ articles in their work in the future (31 to 40 years, 41 to 50 years and 51 to 60 years of age), with the margin of error factored into the results' interpretation.

It is noted that the 'No' response for the other two age sub-groups (20 to 30 years and 61 years of age and over) is nil. Consequently, while the margin of error formula prevents making a conclusive statement across all age sub-groups, it does appear that if whatever the 'Depends' provisos are for the respondents are negated or satisfied, then one could reasonably surmise that the 'Depends' respondents may move into the 'Yes' category for their age groups. This would enable the results to illustrate convincingly that age was not a factor influencing whether or not an academic would cite EJ articles in the future. However, this supposition needs to be further tested to be validated.

[54] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[55] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

Table 31 **Age Cross Tabulated with Citing EJ Articles in the Future (Questions 2 and 13)**

	Citing EJ Articles in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer to Question 13 (percent)	
Age					
20-30	4 (50)	0 (0)	4 (50)	0 (0)	8 (100)
31-40	25 (83)	0 (0)	5 (17)	0 (0)	30 (100)
41-50	67 (82)	4 (5)	10 (12)	1 (1)	82 (100)
51-60	54 (77)	2 (3)	14 (20)	0 (0)	70 (100)
61 and over	10 (67)	0 (0)	5 (33)	0 (0)	15 (100)
No answer	2 (100)	0 (0)	0 (0)	0 (0)	2 (100)
Total	162	6	38	1	207

Age also did not appear to be a factor influencing whether or not an academic had submitted an article to an EJ in the years 1994 to 1998. Across all age sub-groups, Table 32 below clearly shows that all academic age sub-groups had tended *not* to submit articles to EJs.

Table 32 Age Cross Tabulated with Submission of Articles to EJs in the Years 1994 to 1998 (Questions 2 and 15)

	Submission of Articles to EJs			Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	
Age				
20-30	1 (13)	7 (88)	0 (0)	8 (100[56])
31-40	3 (10)	27 (90)	0 (0)	30 (100)
41-50	9 (11)	73 (89)	0 (0)	82 (100)
51-60	5 (7)	65 (93)	0 (0)	70 (100)
61 and over	1 (7)	14 (93)	0 (0)	15 (100)
No answer	1 (50)	1 (50)	0 (0)	2 (100)
Total	20	187	0	207

[56] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

The eldest age sub-group had an evident intention to *not* submit articles to EJs in the future, as can be discerned from Table 33 below. Unfortunately, once the margin of error was considered, the results for the other age sub-groups are inconclusive and would benefit from being re-tested on a larger sample to gain more conclusive results.

Table 33 Age Cross Tabulated with Intention to Submit Articles to EJs in the Future (Questions 2 and 17)

	Submission to EJs in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer to Question 17 (percent)	
Age					
20-30	2 (25)	6 (75)	0 (0)	0 (0)	8 (100)
31-40	8 (27)	8 (27)	13 (43)	1 (3)	30 (100)
41-50	27 (33)	26 (32)	28 (34)	1 (1)	82 (100)
51-60	19 (27)	32 (46)	18 (26)	1 (1)	70 (100)
61 and over	1 (7)	12 (80)	2 (13)	0 (0)	15 (100)
No answer	1 (50)	0 (0)	1 (50)	0 (0)	2 (100)
Total	58	84	62	3	207

To gain additional clarification, age was also cross-tabulated with respondents' submissions to paper journals, as can be seen in Table 34 below. Table 34 illustrates that for all age sub-groups, with the exception of the 20 to 30 age group, for whom the data were insufficiently clear, respondents submitting articles to paper journals during the years 1994 to 1998 was statistically significant, once the margin of error was considered.

While the eldest age sub-group had a clear intention to *not* submit articles to EJs in the future (see Table 33), they were quite active publishers in paper-based journals. While the survey did not ask them about their intentions to publish in paper-based journals in the future, it can be assumed that their publishing behaviour would be unlikely

to change. This illustrates that one age sub-group *did* hold a clear preference for publishing in paper-based journals over publishing in EJs at the time the survey was conducted.

Table 33 above clearly demonstrated that all faculty age sub-groups have tended *not* to submit articles to EJs at the time the survey was conducted, while Table 34 below illustrates that all faculty age sub-groups have tended *to* submit articles to paper-based journals, with the possible exception of the 20 to 30 age group, for whom the data were inadequate. Once again, this illustrates credibly that age was not a factor at the time the survey was conducted influencing an academic's usage and their behaviour towards EJs.

Table 34 Age Cross Tabulated with Submission of Articles to Paper-based Journals in the Years 1994 to 1998 (Questions 2 and 14)

	Submission of Articles to Paper-based Journals			Total (percent)
	Yes (percent)	No (percent)	No Answer to Question 14 (percent)	
Age				
20-30	5 (63)	3 (38)	0 (0)	8 (100[57])
31-40	21 (70)	9 (30)	0 (0)	30 (100)
41-50	54(66)	27 (33)	1 (1)	82 (100)
51-60	52 (74)	18 (26)	0 (0)	70 (100)
61 and over	12 (80)	3 (20)	0 (0)	15 (100)
No answer	2 (100)	0 (0)	0 (0)	2 (100)
Total	146	60	1	207

The results in Table 35 below also do not support the hypothesis that younger faculty will be more inclined to use EJs. If the hypothesis were to be supported it could be assumed that younger faculty would either agree or disagree more strongly, due

[57] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

to their more informed opinion coming from their hypothesised increased usage, with the statement that EJs have poor or inconsistent quality articles. Indeed, Table 35 demonstrates that the majority of respondents, across all age sub-groups, were either neutral or had no opinion regarding this issue at the time the survey was conducted. Unfortunately, the one exception to this conclusion is the youngest sub-group, where there are insufficient data, once the margin of error was considered, to state conclusively what its respondents believed.

Table 35 Age Cross Tabulated with Belief that Most EJs have Poor or Inconsistent Quality Articles (Questions 2 and 25)

	EJs have Poor or Inconsistent Quality Articles						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer to Question 25 (percent)	
Age							
20-30	0 (0)	1 (13)	6 (75)	1 (13)	0 (0)	0 (0)	8 (100)
31-40	4 (13)	3 (10)	18 (60)	5 (17)	0 (0)	0 (0)	30 (100)
41-50	1 (1)	9 (11)	54 (66)	18 (22)	0 (0)	0 (0)	82 (100)
51-60	1 (1)	12 (17)	41 (59)	14 (20)	1 (1)	1 (1)	70 (100[58])
61 and over	1 (7)	2 (13)	11 (73)	1 (7)	0 (0)	0 (0)	15 (100)
No answer	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	2 (100)
Total	7	27	132	39	1	1	207

[58] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

The results in Table 36 below are insufficiently clear for all sub-groups to enable valid conclusions to be drawn. This question would benefit from being re-tested on a larger sample to obtain more valid results.

Table 36 Age Cross Tabulated with Belief that Publishing in EJs Does Not Contribute to Promotion or Tenure (Questions 2 and 29)

	Publishing in EJs does not Contribute to Promotion or Tenure						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer to Question 29 (percent)	
Age							
20-30	0 (0)	1 (13)	4 (50)	3 (38)	0 (0)	0 (0)	8 (100[59])
31-40	0 (0)	5 (17)	14 (47)	10 (33)	1 (3)	0 (0)	30 (100)
41-50	1 (1)	16 (20)	40 (49)	22 (27)	3 (4)	0 (0)	82 (100[60])
51-60	0 (0)	13 (19)	33 (47)	20 (29)	2 (3)	2	70 (100[61])
61 and over	0 (0)	3 (20)	7 (47)	5 (33)	0 (0)	0 (0)	15 (100)
No answer	0 (0)	1 (50)	1 (50)	0 (0)	0 (0)	0 (0)	2 (100)
Total	1	39	99	60	6	2	207

Table 37 below reveals that two age sub-groups (20 to 30 and 51 to 60 years of age) both 'Rarely' or 'Never' used EJs when researching new topics at the time the survey was conducted and so the hypothesis outlined above is not supported. Unfortunately, the results for the other age sub-groups are insufficient to draw defensible conclusions, once the margin of error was considered, and would benefit from being re-tested on a larger sample to obtain more justifiable results. Even though only valid results from two age sub-groups were obtained, given that they are nearly at the opposite ends of

[59] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[60] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[61] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

the age spectrum, it can be reasonably inferred that the result does not support the hypothesis out lined earlier.

It is interesting to note that for each age group the number of academics who chose 'always' was at all times less than those who chose 'never'. While this result is not valid statistically, it is nonetheless an interesting trend.

Table 37 Age Cross Tabulated with Usage of EJs When Researching a New Topic (Questions 2 and 34)

	Usage of EJs When Researching a New Topic						Total (percent)
	Always (percent)	Usually (percent)	Some of the time (percent)	Rarely (percent)	Never (percent)	No answer to Question 34 (percent)	
Age							
20-30	0 (0)	0 (0)	1 (13)	1 (13)	6 (75)	0 (0)	8 (100[62])
31-40	2 (7)	8 (27)	8 (27)	5 (17)	7 (23)	0 (0)	30 (100[63])
41-50	9 (11)	24 (29)	19 (23)	18 (22)	12 (15)	0 (0)	82 (100)
51-60	6 (9)	11 (16)	17 (24)	20 (29)	15 (21)	1 (1)	70 (100)
61 and over	0 (0)	2 (13)	4 (27)	5 (33)	4 (27)	0 (0)	15 (100)
No answer	0 (0)	0 (0)	1 (50)	1 (50)	0 (0)	0 (0)	2 (100)
Total	17	45	50	50	44	1	207

Table 38 below illustrates that two age sub-groups (41 to 50 and 51 to 60 years of age) both 'Rarely' or 'Never' read EJs to keep in touch with areas in which they teach and/or have qualifications. Unfortunately, the results for the other age sub-groups are unsatisfactorily to draw valid conclusions, once the margin of error was considered, and would benefit from being re-tested on a larger sample to obtain more legitimate results.

[62] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[63] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

As such, no inference should be made from this result regarding the hypothesis as the two age sub-groups with valid results are not sufficiently diverse to discern if age is a factor influencing how academics use EJs when researching new topics.

Table 38 **Age Cross Tabulated with Reading EJs to Keep in Touch with Topics Associated with Areas in which the Academic Teaches &/or has Qualifications (Questions 2 and 35)**

	Usage of EJs to Keep in Touch with Topics Associated with Areas in which the Academic Teaches &/or has Qualifications						Total (percent)
	Always (percent)	Usually (percent)	Some of the time (percent)	Rarely (percent)	Never (percent)	No answer to Question 35 (percent)	
Age							
20-30	0 (0)	0 (0)	2 (25)	1 (13)	5 (63)	0 (0)	8 (100[64])
31-40	1 (3)	3 (10)	12 (4)	7 (23)	7 (23)	0 (0)	30 (100[65])
41-50	7 (9)	12 (15)	27 (33)	20 (24)	16 (20)	0 (0)	82 (100[66])
51-60	5 (7)	5 (7)	24 (34)	19 (27)	16 (23)	1 (1)	70 (100[67])
61 and over	0 (0)	2 (13)	6 (40)	4 (27)	3 (20)	0 (0)	15 (100)
No answer	0 (0)	0 (0)	1 (50)	1 (50)	0 (0)	0 (0)	2 (100)
Total	13	22	72	52	47	1	207

The hypothesis that younger academics at ECU would be the heaviest users of EJs as demonstrated by their having a greater interest, awareness of, or disposition to use EJs in the future than 'older' ECU faculty was generally not supported by the results from the current study. While a portion of the analysis was inconclusive due to the small sub-group sample numbers, Tables 29 to 38 do provide satisfactory evidence to suggest

[64] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[65] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.
[66] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[67] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

that for ECU an academics' age is not a factor influencing their usage of EJs.

5.4 Differences in the Usage of EJs by the Amount of Time Passed Since Last Qualification

The literature review noted that while there had been a number of research articles on age as a factor influencing academics' usage of EJs, there appeared to have been no research on the length of time since an academic's last qualifications was conferred and its possible influence on the usage of EJs. Speier et al.'s (1999) results did indicate that more senior and established academics might be more prepared to publish in EJs than their younger less established peers.

Therefore, this study investigated the hypothesis that faculty with the greatest amount of time passing since their last qualification would be the heaviest users of EJs and consequently demonstrate a greater interest, awareness of or disposition to use them in the future than other ECU faculty.

The following margins of error were calculated and used to analyse Tables 40 to 48.

Table 39 Margins of Error for Amount of Time Passed Since Last Qualification

Qualification	Sample Size (percent)	Margin of Error (percent)
Currently Studying	40 (19)	16
Less Than 1 Year	12 (6)	29
More Than 1 Year Less Than 5Years	43 (21)	15
More Than 5 Years Less Than 10 Years	45 (22)	15
More Than 10 Years	67 (32)	12
Total	207 (100)	

Tables 40 to 48 generally do not support the hypothesis outlined above.

Table 40 below reveals that the amount of time since the academics' last qualification being gained was *not* a factor that influenced whether or not the academic had a personal subscription to an EJ at the time the survey was conducted. The results in column 3, when compared to column 2, clearly shows that all the qualifications sub-groups have substantially tended to not hold subscriptions to EJs and thus the hypothesis above is not supported.

Table 40 Time Since Last Qualification Gained Cross Tabulated with Personal Subscriptions to EJs (Questions 3 and 10)

	Personal Subscriptions to EJs			
	Yes (percent)[68]	**No (percent)**	**Depends (percent)**	**Total (percent)**
Qualification				
Currently Studying	6 (15)	34 (85)	0 (0)	40 (100)
Less Than 1 Year	2 (17)	10 (83)	0 (0)	12 (100)
More Than 1 Year Less Than 5Years	9 (21)	34 (79)	0 (0)	43 (100)
More Than 5 Years Less Than 10 Years	5 (11)	40 (89)	0 (0)	45 (100)
More Than 10 Years	13 (19)	54 (81)	0 (0)	67 (100)
Total	35	172	0	207

[68] Note: All percentages in Tables 40 to 48 are rounded to the nearest whole number for presentation in the tables. While the unrounded figures total 100 percent, the rounding process may affect the total. Where this happens and the rounded figures total more or less than 100 percent, this will be noted and the figure in the last column rounded to 100 percent.

Unfortunately, once the margin of error was considered, the results in Table 41 below were vague and as such could not support valid conclusions for four of the five sub-groups. The results for the 'More Than 10 Years' sub-group illustrate that they were more likely to *not* cite EJ articles in their own work at the time the survey was conducted, then they were to cite them. While no conclusions can be made about the other sub-groups this table does not support the hypothesis that the sub-group with the largest amount of time passing since their last qualification would be the heaviest users of EJs as even this sub-group were unlikely to cite EJ articles. However, this question would benefit from being re-tested on a larger sample to gain more convincing results.

Table 41 **Time since Last Qualification Gained Cross Tabulated with Citing EJ Articles in Own Work (Questions 3 and 12)**

	Citing EJ Articles in Own Work			
	Yes (percent)	**No (percent)**	**Depends (percent)**	**Total (percent)**
Qualification				
Currently Studying	19 (48)	21 (52)	0 (0)	40 (100)
Less Than 1 Year	7 (58)	5 (42)	0 (0)	12 (100)
More Than 1 Year Less Than 5Years	17 (40)	26 (60)	0 (0)	43 (100)
More Than 5 Years Less Than 10 Years	19 (42)	26 (58)	0 (0)	45 (100)
More Than 10 Years	24 (36)	43 (64)	0 (0)	67 (100)
Total	86	121	0	207

Four sub-groups including those currently studying, those with qualifications gained more than 1 year and less than 5 years, more than 5 years and less than 10 years and more than 10 years ago, all intended to cite EJ articles in the future at the time the survey was conducted as illustrated in Table 42 below. The sub-group exception, those with qualifications gained less than one year previously did not have a sufficiently clear result, once the margin of error was considered, to gain meaningful results. However, it was noted that for that sub-group no respondent chose the 'No' category, but that three respondents all chose 'Depends'. This might indicate that if the reasons for their 'Depends' choice were negated or removed they may move to being 'Yes' respondents, giving a result that would indicate no difference between the sub-groups. However, given the clear results from three of the four sub-groups illustrating a similar intention to cite EJ articles in the future, the results from Table 42 do not support the hypothesis outlined above.

Table 42 Time since Last Qualification Gained Cross Tabulated with Citing EJ Articles in the Future (Questions 3 and 13)

	Citing EJ Articles in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer (percent)	
Qualification Currently Studying	39 (98)	0 (0)	1 (2)	0 (0)	40 (100)
Less Than 1 Year	9 (75)	0 (0)	3 (25)	0 (0)	12 (100)
More Than 1 Year Less Than 5Years	36 (84)	0 (0)	6 (14)	1 (2)	43 (100)
More Than 5 Years Less Than 10 Years	30 (67)	3 (7)	12 (27)	0 (0)	45 (100[69])
More Than 10 Years	48 (72)	3 (4)	16 (24)	0 (0)	67 (100)
Total	162	6	38	1	207

[69] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

Table 43 below demonstrates that all sub-groups had consistently *not* submitted articles to EJs at the time the survey was conducted as can be seen in column 3. The results reveal that the amount of time passing since the academics' last qualification was conferred had tended to *not* influence their behaviour in *not* submitting articles to EJs and as a result does not support the hypothesis outlined above.

Table 43 Time since Last Qualification Gained Cross Tabulated with Submission of Articles to EJs in the Years 1994 to 1998 (Questions 3 and 15)

	Submission of Articles to EJs			
	Yes (percent)	**No (percent)**	**Depends (percent)**	**Total (percent)**
Qualification				
Currently Studying	2 (5)	38 (95)	0 (0)	40 (100)
Less Than 1 Year	2 (17)	10 (83)	0 (0)	12 (100)
More Than 1 Year Less Than 5Years	5 (12)	38 (88)	0 (0)	43 (100)
More Than 5 Years Less Than 10 Years	4 (9)	41 (91)	0 (0)	45 (100)
More Than 10 Years	7 (10)	60 (90)	0 (0)	67 (100)
Total	20	187	0	207

The sub-group with the most amount of time passing since their last qualification was conferred had a demonstrable intention to *not* submit articles to EJs in the future at the time the survey was conducted, as shown in Table 44, column 3 below.

This does not support the hypothesis outlined above. Unfortunately for the other four sub-groups the results were not satisfactorily clear, when the margin of error was considered, to be able to draw any valid conclusions. As such, the results for those sub-groups are inconclusive and do not indicate whether all the sub-groups would behave similarly to the 'More Than 10 Years' sub-group. This question would benefit from being re-tested on a larger sample to give more valid results.

However, it is interesting to note that the 'currently studying' sub-group had a majority of respondents interested in submitting articles to EJs in the future at the time the study was conducted, whereas the other sub-groups had a majority of respondents who intended to *not* submit articles to EJs in the future. This may indicate that academics currently studying are more adventurous than other academics. It may also indicate that academics currently studying may be using EJs and as such not averse to publishing in them as well. Though these suppositions are not clear as academics with qualifications conferred less than one year ago also had a majority not interested in publishing in them in the future. While this result is not valid statistically, it is nonetheless an interesting result and would benefit from more research.

Table 44 Time since Last Qualification Gained Cross Tabulated with Intention to Submit Articles to EJs in the Future (Questions 3 and 17)

	Submission to EJs in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer (percent)	
Qualification					
Currently Studying	17 (43)	11 (28)	12 (30)	0 (0)	40 (100[70])
Less Than 1 Year	3 (25)	7 (58)	2 (17)	0 (0)	12 (100)
More Than 1 Year Less Than 5Years	13 (30)	20 (47)	10 (23)	0 (0)	43 (100)
More Than 5 Years Less Than 10 Years	13 (29)	14 (31)	16 (36)	2 (4)	45 (100)
More Than 10 Years	12 (18)	32 (48)	22 (33)	1 (1)	67 (100)
Total	58	84	62	3	207

The results in Table 45 below also generally do not support the hypothesis outlined above.

The results for the 'Currently Studying' sub-group are inconclusive. However, within this sub-group, when the results for respondents who either 'Strongly Agree' or 'Agree' are aggregated, becoming 11 percent of the sub-groups total, and then compared to respondents who are either 'Neutral' or have 'No opinion' (58 percent of the sub-group's total), and the margin of error is used to analyse the results (plus or minus 16 percent) the results indicate that respondents who are either 'Neutral' or have 'No opinion' is statistically significant over those who either 'Strongly Agree' or 'Agree'.

However, the results for the 'Disagree' respondents (33 percent of the sub-group's total) overlaps with the 'Neutral' or have 'No opinion' respondents, using the margin of error formula, meaning that the same conclusion cannot be reached for the 'Disagree' respondents for that sub-group. Fortunately, the results for the other four sub-groups are clear and for each sub-group ECU's academics proved to be mainly neutral or had no opinion regarding if EJs contain poor or inconsistent quality articles at the time the study was conducted.

Table 45 Time since Last Qualification Gained Cross Tabulated with Belief that most EJs have Poor or Inconsistent Quality Articles (Questions 3 and 25)

	EJs have Poor or Inconsistent Quality Articles						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer (percent)	
Qualification							
Currently Studying	1 (3)	3 (8)	23 (58)	13 (33)	0 (0)	0 (0)	40 (100[70])
Less Than 1 Year	0 (0)	1 (8)	9 (75)	2 (17)	0 (0)	0 (0)	12 (100)
More Than 1 Year Less Than 5Years	1 (2)	7 (7)	27 (63)	8 (19)	0 (0)	0 (0)	43 (100)
More Than 5 Years Less Than 10 Years	2 (4)	8 (18)	26 (58)	8 (18)	1 (2)	0 (0)	45 (100)
More Than 10 Years	3 (4)	8 (12)	47 (70)	8 (12)	0 (0)	1 (2)	67 (100)
Total	7	27	132	39	1	1	207

[70] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[71] The actual figure is 102 percent which becomes 100 percent when rounded for presentation in the table.

The results from Table 46 below are not clear and no statistically valid interpretation can be made. The percentages in Column 4 (Neutral or No opinion) may appear to be significantly greater than the aggregated results from columns 2 and 3, and 5 and 6 (Strongly Agree and Agree, and Disagree and Strongly Disagree respectively). However, once the margin of error was considered, the percentages overlap for all sub-groups with the results being no statistically valid analysis can be drawn from the results. Therefore, this question would benefit from being re-tested on a larger sample to gain a more authoritative outcome.

However, it is interesting to note that a majority of respondents either disagreed or strongly disagreed with the statement for all sub-groups, with the exception of the 'More Than 1 Year Less Than 5 Years' which was equal with those who either agreed or strongly agreed. This may indicate that academics at ECU, across most of the different sub-groups, generally believed that publishing in EJs *would* contribute to promotion or tenure at the time the study was conducted. While this result is not valid statistically, it is nonetheless an interesting result and would benefit from more research.

Table 46 **Time since Last Qualification Gained Cross Tabulated with Belief that Publishing in EJs Does Not Contribute to Promotion or Tenure (Questions 3 and 29)**

	Publishing in EJs does not Contribute to Promotion or Tenure						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer (percent)	
Qualification							
Currently Studying	1 (3)	4 (10)	23 (58)	10 (25)	2 (5)	0 (0)	40 (100[72])
Less Than 1 Year	0 (0)	2 (17)	7 (58)	2 (17)	1 (8)	0 (0)	12 (100)
More Than 1 Year Less Than 5Years	0 (0)	12 (28)	18 (42)	11 (26)	1 (2)	1 (2)	43 (100)
More Than 5 Years Less Than 10 Years	0 (0)	9 (20)	18 (40)	16 (36)	2 (4)	0 (0)	45 (100)
More Than 10 Years	0 (0)	12 (18)	33 (49)	21 (31)	0 (0)	1 (2)	67 (100)
Total	1	39	99	60	6	2	207

Four of the sub-groups in Table 47 below, from those currently studying through to those for whom it has been more than 5 years and less than 10 years since they gained their last qualification did not achieve clear results once the margin of error was considered and no clear interpretation can be made from their results. However, for the last sub-group, those who gained their last qualification more than 10 years previously, respondents conclusively *did not* tend to use EJs when researching a new topic. As such, while the results of this correlation may be unclear when comparing the results across all

[72] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

the sub-groups, it is possible to conclude that ECU respondents with the most amount of time passing since their last qualification had not incorporated using EJs into their normal research behaviour at the time the study was conducted and thus the hypothesis outlined above is not supported. It would be interesting to see if this behaviour was consistent across all the sub-groups and this question would benefit from being re-tested on a larger sample to gain more valid results.

Table 47 Time since Last Qualification Gained Cross Tabulated with Usage of EJs when Researching a New Topic (Questions 3 and 34)

	Respondent Searches EJs when Researching a New Topic						Total (percent)
	Always (percent)	Usually (percent)	Some of the Time (percent)	Rarely (percent)	Never (percent)	No answer (percent)	
Qualification							
Currently Studying	4 (10)	12 (30)	12 (30)	9 (23)	2 (5)	1	40 (100[73])
Less Than 1 Year	1 (8)	3 (25)	2 (17)	3 (25)	3 (25)	0 (0)	12 (100)
More Than 1 Year Less Than 5Years	3 (7)	9 (21)	10 (23)	13 (30)	8 (19)	0 (0)	43 (100)
More Than 5 Years Less Than 10 Years	5 (11)	9 (20)	9 (20)	9 (20)	13 (29)	0 (0)	45 (100)
More Than 10 Years	4 (6)	12 (18)	17 (25)	16 (24)	18 (27)	0 (0)	67 (100)
Total	17	45	50	50	44	1	207

[73] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

The results are insufficiently clear in Table 48 below for three of the sub-groups (Currently Studying, Less Than 1 Year and More Than 5 Years and Less Than 10 Years), once the margin of error was considered. For the two other sub-groups (More Than 1 Year and Less Than 5 Years and More Than 10 Years), at the time the study was conducted both tended to either 'Rarely' or 'Never' use EJs to keep in touch with topics in which they either taught or had qualifications. While the results from correlating the amount of time passing since the academic's last qualification was gained and their behaviour in using EJs to keep in touch with topics associated with areas in which they taught or had qualifications may be unclear when comparing the results across all the sub-groups, it is possible to conclude that ECU respondents with the most amount of time passing since their last qualification had not incorporated using EJs into their normal research actions and therefore the hypothesis outlined above is not supported.

Table 48 **Time since Last Qualification Gained Cross Tabulated with Reading EJs to Keep in Touch with Topics Associated with Areas in which the Academic Teaches &/or has Qualifications (Questions 3 and 35)**

	Usage of EJs to Keep in Touch with Topics Associated with Areas in which the Academic Teaches &/or has Qualifications						Total (percent)
	Always (percent)	Usually (percent)	Some of the Time (percent)	Rarely (percent)	Never (percent)	No answer (percent)	
Qualification							
Currently Studying	2 (5)	5 (13)	19 (48)	10 (25)	4 (10)	0 (0)	40 (100[74])
Less Than 1 Year	1 (8)	0 (0)	4 (33)	4 (33)	3 (25)	0 (0)	12 (100[75])
More Than 1 Year Less Than 5Years	2 (5)	7 (16)	11 (26)	13 (30)	10 (23)	0 (0)	43 (100)
More Than 5 Years Less Than 10 Years	5 (11)	3 (7)	16 (36)	9 (20)	11 (24)	1	45 (100)
More Than 10 Years	3 (4)	7 (10)	22 (33)	16 (24)	19 (28)	0 (0)	67 (100[76])
Total	13	22	72	52	47	1	207

Tables 40 to 48 above provide sufficient evidence to refute the hypothesis that ECU academics with the greatest amount of time passing since their last qualification would be the heaviest users of EJs and demonstrate a greater interest, awareness of or disposition to use them in the future than other ECU academics at the time the study was conducted. Indeed, it emerged that the factor of the amount of time passing since an

[74] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[75] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.
[76] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

academic's last qualification was gained did not tend to influence an ECU academic's behaviour regarding EJs.

5.5 Differences in the Usage of EJs by Amount of Research Activity

Speier et al.'s (1999) research indicated that academics who were the most prolific publishers also had a greater awareness of EJs than their less prolific colleagues.

This research study therefore set out to test the hypothesis that ECU academics who carry out the most research activity will be the heaviest users of EJs and accordingly demonstrate a greater interest, awareness of or disposition to use them in the future than other ECU academics.

Table 49 presents the margins of error that were calculated and used to analyse Tables 50 to 59.

Table 49 Margins of Error for Amount of Research Activity

Research Activity	Sample Size (percent)	Margin of Error (percent)
Nil	16 (8)	25
Less Than & Equal To 1 Hour	8 (4)	35
More Than 1 Hour, Less Than & Equal To 5 Hours	45 (22)	15
More Than 5 Hours, Less Than & Equal To 10 Hours	60 (29)	13
More Than 10 Hours	67 (32)	12
No Answer[77]	11 (5)	
Total	207 (100)	

[77] The results for this sub-group were not analysed.

Tables 50 to 59 generally do not support the hypothesis outlined above.

As with previous factors investigating personal subscriptions to EJs, Table 50 below illustrates that across all sub-groups the vast majority of academics at ECU, when the margin of error was considered, did not hold personal subscriptions to EJs at the time the survey was conducted. This is as evident for academics who conduct more than 10 hours of research activity on average per week as it is for those academics who conducted no research activity at the time the survey was conducted. This result does not support the hypothesis outlined above.

Table 50 Research Activity Cross Tabulated with Personal Subscriptions to EJs (Questions 6 and 10)

	Personal Subscriptions to EJs			Total (percent)
	Yes (percent)[78]	No (percent)	Depends (percent)	
Research Activity				
Nil	1 (6)	15 (94)	0 (0)	16 (100)
Less Than & Equal To 1 Hour	0 (0)	8 (100)	0 (0)	8 (100)
More Than 1 Hour, Less Than & Equal To 5 Hours	2 (4)	43 (96)	0 (0)	45 (100)
More Than 5 Hours, Less Than & Equal To 10 Hours	13 (22)	47 (78)	0 (0)	60 (100)
More Than 10 Hours	17 (25)	50 (75)	0 (0)	67 (100)
No Answer to Question 6	2 (18)	9 (82)	0 (0)	11 (100)
Total	35	172	0	207

[78] Note: All percentages in Tables 50 to 59 are rounded to the nearest whole number for presentation in the tables. While the unrounded figures total 100 percent, the rounding process may affect the total. Where this

Table 51 below does not provide clear results for four of the sub-groups (Less Than and Equal To 1 Hour; More Than 1 Hour, Less Than and Equal To 5 Hours; More Than 5 Hours, Less Than and Equal To 10 Hours and More Than 10 Hours), once the margin of error was considered. The sub-group 'Nil' clearly did *not* cite EJ articles in their own work at the time the survey was conducted. This is a logical outcome given the respondents' claim to conduct nil research activity during an average week during a semester. While a majority of respondents in each of the four other sub-groups have also not cited EJ articles in their own work, once the margin of error was considered, the results overlap and so are inconclusive. However it is an interesting result and may indicate a general preference to not cite EJs at the time the survey was conducted. This result would benefit from being re-tested on a larger sample to gain more legitimate results.

Table 51 Research Activity Cross Tabulated with Citing EJ Articles in Own Work (Questions 6 and 12)

Research Activity	Citing EJ Articles in Own Work			Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	
Nil	3 (19)	13 (81)	0 (0)	16 (100)
Less Than & Equal To 1 Hour	3 (38)	5 (63)	0 (0)	8 (100[79])
More Than 1 Hour, Less Than & Equal To 5 Hours	17 (38)	28 (62)	0 (0)	45 (100)
More Than 5 Hours, Less Than & Equal To 10 Hours	28 (47)	32 (53)	0 (0)	60 (100)
More Than 10 Hours	31 (46)	36 (54)	0 (0)	67 (100)
No Answer to Question 6	4 (36)	7 (64)	0 (0)	11 (100)
Total	86	121	0	207

happens and the rounded figures total more or less than 100 percent, this will be noted and the figure in the last column rounded to 100 percent.

Four of the five sub-groups (Nil; More Than 1 Hour, Less Than and Equal To 5 Hours; More Than 5 Hours, Less Than and Equal To 10 Hours and More Than 10 Hours) clearly intended to cite EJ articles in their research in the future at the time the survey was conducted as illustrated in Table 52 below, after the margin of error was considered. The result for the one sub-group exception, Less Than and Equal To 1 Hour research activity per week during a semester, is not sufficiently clear to draw a conclusion for this sub-group. Therefore the results of correlating research activity with an academic's intention to use EJs in their future research appears to indicate that the amount of research activity was not a factor influencing an academics' usage of EJs and therefore the hypothesis outlined earlier is not supported.

Table 52 Research Activity Cross Tabulated with Citing EJ Articles in the Future (Questions 6 and 13)

Research Activity	Citing EJ Articles in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer to Question 13 (percent)	
Nil	11 (69)	2 (13)	3 (19)	0 (0)	16 (100[80])
Less Than & Equal To 1 Hour	6 (75)	1 (13)	1 (13)	0 (0)	8 (100[81])
More Than 1 Hour, Less Than & Equal To 5 Hours	35 (78)	0 (0)	10 (22)	0 (0)	45 (100)
More Than 5 Hours, Less Than & Equal To 10 Hours	49 (82)	3 (5)	8 (13)	0 (0)	60 (100)
More Than 10 Hours	51 (76)	0 (0)	15 (22)	1 (2)	67 (100)
No Answer to Question 6	10 (91)	0 (0)	1 (9)	0 (0)	11 (100)
Total	162	6	38		207

[79] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[80] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

A similar result was obtained when ECU's academics were asked if they had submitted articles to EJs between the years 1994 to 1998, as illustrated in Table 53 below, and this was correlated with their research activity. A statistically significant majority, when the margin of error was considered, in all sub-groups had *not* submitted articles to EJs at the time the survey was conducted. Therefore, the results of correlating research activity with an academic's behaviour in submitting articles to EJs reveals that the amount of research activity was not a factor influencing an academic's usage of EJs and therefore the hypothesis outlined earlier is not supported.

Table 53 Research Activity Cross Tabulated with Submission of Articles to EJs in the Years 1994 to 1998 (Questions 6 and 15)

Research Activity	Submission of Articles to EJs			Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	
Nil	0 (0)	16 (100)	0 (0)	16 (100)
Less Than & Equal To 1 Hour	1 (13)	7 (88)	0 (0)	8 (100[82])
More Than 1 Hour, Less Than & Equal To 5 Hours	5 (11)	40 (89)	0 (0)	45 (100)
More Than 5 Hours, Less Than & Equal To 10 Hours	6 (10)	54 (90)	0 (0)	60 (100)
More Than 10 Hours	5 (8)	62 (93)	0 (0)	67 (100[83])
No Answer to Question 6	3 (27)	8 (73)	0 (0)	11 (100)
Total	20	187	0	207

[81] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[82] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

For comparison Table 54 below is provided. Table 54 illustrates that when research activity is correlated with ECU academics' behaviour in submitting articles to paper-based journals a different picture emerges. The results for two of the sub-groups (Nil and Less Than and Equal To 1 Hour) were not clear, once the margin of error was considered. However for the other three remaining sub-groups (More Than 1 Hour and Less Than and Equal To 5 Hours; More Than 5 Hours and Less Than and Equal To 10 Hours and More Than 10 Hours) were all statistically significant publishers in paper-based journals. This does suggest that the medium is important, that active academic researchers at ECU have a clear preference to publish in paper-based journals than EJs at the time the survey was conducted.

Table 54 Research Activity Cross Tabulated with Submission of Articles to Paper-based Journals (Questions 6 and 14)

Research Activity	Submission of Articles to EJs			Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	
Nil	6 (38)	10 (63)	0 (0)	16 (100[84])
Less Than & Equal To 1 Hour	3 (38)	5 (63)	0 (0)	8 (100[85])
More Than 1 Hour, Less Than & Equal To 5 Hours	33 (73)	12 (27)	0 (0)	45 (100)
More Than 5 Hours, Less Than & Equal To 10 Hours	42 (70)	18 (30)	0 (0)	60 (100)
More Than 10 Hours	42 (63)	18 (27)	0 (0)	67 (100)
No Answer to Question 6	7 (64)	4 (36)	0 (0)	11 (100)
Total	146	61	0	207

[83] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[84] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table
[85] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

Unfortunately, the result for Table 55 below is vague and is not open for easy interpretation. Respondents who tended to conduct 'Nil' research activity during the semester also did not intend to submit articles to EJs in the future at the time the survey was conducted. While analysing the outcomes from previous tables, where the 'No' column has largely had no respondents represented and instead most respondents not choosing 'Yes' have opted for 'Depends'; it has been assumed that if the reasons for respondents choosing 'Depends' were annulled then it was possible to assume they might move to become 'Yes' respondents. If this is also assumed for Table 55 below, the results still remain largely unclear for three of the remaining sub-groups (Less Than and Equal To 1 Hour; More Than 1 Hour and Less Than and Equal To 5 Hours and More Than 10 Hours), with only one sub-group (More Than 5 Hours and Less Than and Equal To 10 Hours) perhaps gaining a significant majority of 'Yes' respondents.

When compared to previous publishing activity in Table 54 above, Table 55 below does suggest that active academic researchers at ECU had a preference to publish in paper-based journals rather than EJs at the time the survey was conducted.

Even the results from this correlation are not statistically valid, it nonetheless is an interesting outcome as many ECU academics, at the time the study was conducted, did not intent to submit articles to EJs in the future. This is an outcome that ECUs librarians need to consider when evaluating the impact of their decision to devote 30 percent of their resource and access budget to digital resources from 1998 (L. Leslie, personal communication, June 24, 2001).

Table 55 **Research Activity Cross Tabulated with Intention to Submit Articles to EJs in the Future (Questions 6 and 17)**

	Submission to EJs in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer to Question 17 (percent)	
Research Activity					
Nil	1 (6)	12 (75)	2 (13)	1 (6)	16 (100)
Less Than & Equal To 1 Hour	1 (13)	3 (38)	4 (50)	0 (0)	8 (100[86])
More Than 1 Hour, Less Than & Equal To 5 Hours	12 (27)	20 (44)	12 (27)	0 (0)	45 (100[87])
More Than 5 Hours, Less Than & Equal To 10 Hours	23 (38)	16 (27)	21 (35)	0 (0)	60 (100)
More Than 10 Hours	18 (27)	29 (43)	19 (28)	1 (2)	67 (100)
No Answer to Question 6	3 (27)	4 (36)	4 (36)	0 (0)	11 (100[88])
Total	58	84	62	1	207

[86] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[87] The actual figure is 98 percent which becomes 100 percent when rounded for presentation in the table.
[88] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

Table 56 below establishes that a statistically significant majority of respondents, across all the research activity sub-groups, once the margin of error was considered, were either neutral or had no opinion regarding the issue that EJs had either poor or inconsistent quality articles at the time the survey was conducted.

Table 56 Research Activity Cross Tabulated with Belief that most EJs have Poor or Inconsistent Quality Articles (Questions 6 and 25)

	EJs have Poor or Inconsistent Quality Articles						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No Answer to Question 25 (percent)	
Research Activity							
Nil	1 (6)	0 (0)	15 (94)	0 (0)	0 (0)	0 (0)	16 (100)
Less Than & Equal To 1 Hour	0 (0)	0 (0)	7 (88)	1 (13)	0 (0)	0 (0)	8 (100[89])
More Than 1 Hour, Less Than & Equal To 5 Hours	2 (4)	6 (13)	31 (69)	6 (13)	0 (0)	0 (0)	45 (100[90])
More Than 5 Hours, Less Than & Equal To 10 Hours	3 (5)	10 (17)	31 (52)	16 (27)	0 (0)	0 (0)	60 (100[91])
More Than 10 Hours	1 (2)	9 (13)	40 (60)	15 (22)	1 (2)	1 (2)	67 (100[92])
No Answer to Question 6	0 (0)	2 (18)	8 (73)	1 (9)	0 (0)	0 (0)	11 (100)
Total	7	27	132	39	1	1	207

[89] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[90] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

The results for Table 57 below are inadequate to provide a simple interpretation. Respondents who conducted 'Nil' research activity during the semester tended to hold a neutral or no opinion concerning the belief that publishing in EJs did not contribute to promotion or tenure at the time the survey was conducted. The results for respondents who conducted Less Than and Equal To 1 Hour and More Than 1 Hour and Less Than and Equal To 5 Hours research activity during the semester was unclear, once the margin of error was considered, for any interpretation to be made. However, once the results for respondents who conducted More Than 5 Hours and Less Than and Equal To 10 Hours and More Than 10 Hours of research activity per week during a semester was closely examined it was noted that once the margin of error was considered, a clear majority of the two sub-groups were either neutral or had no opinion regarding whether publishing in EJs contributed to promotion or tenure, rather than agreeing or strongly agreeing with the statement. However, the results are too close for interpretation for these two sub-groups when comparing the neutral or no opinion respondents with those who either disagreed or strongly disagreed.

This is an interesting outcome given ECU's active researchers' clear preference to publish in paper-based journals over EJs. One would generally have assumed that their preference to publish in paper-based journals could have been due to an assumption on their part that publishing in that medium would be a greater factor in contributing to promotion and tenure, yet Table 57 below illustrates that this assumption is not clearly supported.

[91] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[92] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

Table 57 **Research Activity Cross Tabulated with Belief that Publishing in EJs Does Not Contribute to Promotion or Tenure (Questions 6 and 29)**

	Publishing in EJs does not Contribute to Promotion or Tenure						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No Answer to Question 29 (percent)	
Research Activity							
Nil	0 (0)	2 (13)	12 (75)	2 (13)	0 (0)	0 (0)	16 (100[93])
Less Than & Equal To 1 Hour	0 (0)	4 (50)	4 (50)	0 (0)	0 (0)	0 (0)	8 (100)
More Than 1 Hour, Less Than & Equal To 5 Hours	0 (0)	11 (24)	16 (36)	17 (38)	0 (0)	1 (2)	45 (100)
More Than 5 Hours, Less Than & Equal To 10 Hours	0 (0)	12 (20)	28 (47)	16 (27)	4 (7)	0 (0)	60 (100[94])
More Than 10 Hours	0 (0)	12 (18)	33 (49)	19 (28)	2 (3)	1 (2)	67 (100)
No Answer to Question 6	1 (9)	2 (18)	6 (55)	2 (18)	0 (0)	0 (0)	11 (100)
Total	1	39	99	60	6	2	207

The results for table 58 below are also insufficiently clear for interpretation, once the margin of error was considered. The one sub-group with a clear result was for the More Than 1 Hour and Less Than and Equal To 5 Hours sub-group, for whom the

[93] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[94] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

majority 'Rarely' or 'Never' used EJs when researching a new topic at the time the survey was conducted. While the results cannot be used to compare differences between the different sub-groups, it is interesting to note that the most prolific researchers – those who conducted more than 10 hours of research per week during a semester – did not have a clear majority of respondents using EJs when researching a new topic, thereby suggesting, albeit not conclusively, that the hypothesis outlined earlier is not supported.

However, while the results in Table 58 may not be sufficiently clear for interpretation, it is again important to note that considerable numbers of ECUs active researchers either never or rarely consult EJs when researching a new topic. This is a result worthy of investigation by ECU's librarians.

Table 58 Research Activity Cross Tabulated with Usage of EJs when Researching a New Topic (Questions 6 and 34)

	Respondent Searches EJs when Researching a New Topic						Total (percent)
	Always (percent)	Usually (percent)	Some of the Time (percent)	Rarely (percent)	Never (percent)	No Answer to Question 35 (percent)	
Research Activity							
Nil	0 (0)	4 (25)	4 (25)	1 (6)	7 (44)	0 (0)	16 (100)
Less Than & Equal To 1 Hour	1 (13)	2 (25)	0 (0)	2 (25)	3 (38)	0 (0)	8 (100[95])
More Than 1 Hour, Less Than & Equal To 5 Hours	3 (7)	4 (9)	14 (31)	11 (24)	12 (27)	1 (2)	45 (100)
More Than 5 Hours, Less Than & Equal To 10 Hours	1 (2)	19 (32)	17 (28)	16 (27)	7 (12)	0 (0)	60 (100[96])
More Than 10 Hours	11 (16)	12 (18)	13 (19)	18 (27)	13 (19)	0 (0)	67 (100[97])
No Answer to Question 6	1 (9)	4 (36)	2 (18)	2 (18)	2 (18)	0 (0)	11 (100[98])
Total	17	45	50	50	44	1	207

While the results for tables 57 to 58 above have been somewhat vague, the outcome for Table 59 below is quite explicit and illustrates that for four of the sub-groups

[95] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[96] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[97] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.
[98] The actual figure is 99 percent which becomes 100 percent when rounded for presentation in the table.

(Nil; More Than 1 Hour and Less Than and Equal To 5 Hours; More Than 5 Hours and Less Than and Equal To 10 Hours and More Than 10 Hours) a clear majority of respondents, once the margin of error was considered, tended *not* to read EJs to keep in touch with topics in which the respondent either taught or had qualifications at the time the survey was conducted. The result was similar for respondents who conducted 'Nil" research as it was for those who conducted more than 10 hours of research each week during the semester at the time the survey was conducted. This does not support the hypothesis outlined earlier.

It is noted that even though 63 percent of respondents for the Less Than and Equal To 1 Hour sub-group chose the 'Rarely' or 'Never' options, the margin was not sufficiently wide to give a clear outcome, once the margin of error was considered for that sub-group (plus or minus 35 percent). However this may indicate a trend and is worthy of further investigation to gain more conclusive results.

Table 59 **Research Activity Cross Tabulated with Reading EJs to Keep in Touch with Topics Associated with Areas in which the Academic Teaches &/or has Qualifications (Questions 6 and 35)**

	Usage of EJs to Keep in Touch with Topics Associated with Areas in Which the Academic Teaches &/or has Qualifications						Total (percent)
	Always (percent)	Usually (percent)	Some of the Time (percent)	Rarely (percent)	Never (percent)	No Answer to Question 35 (percent)	
Research Activity							
Nil	0 (0)	2 (13)	5 (31)	2 (13)	7 (44)	0 (0)	16 (100[99])
Less Than & Equal To 1 Hour	1 (13)	0 (0)	2 (25)	2 (25)	3 (38)	0 (0)	8 (100[100])
More Than 1 Hour, Less Than & Equal To 5 Hours	3 (7)	4 (9)	15 (33)	9 (20)	14 (31)	0 (0)	45 (100)
More Than 5 Hours, Less Than & Equal To 10 Hours	2 (3)	9 (15)	22 (37)	19 (32)	8 (13)	0 (0)	60 (100)
More Than 10 Hours	7 (10)	5 (7)	22 (33)	18 (27)	14 (21)	1 (2)	67 (100)
No Answer to Question 6	0 (0)	2 (18)	6 (55)	2 (18)	1 (9)	0 (0)	11 (100)
Total	13	22	72	52	47	1	207

[99] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.
[100] The actual figure is 101 percent which becomes 100 percent when rounded for presentation in the table.

Unfortunately, the results for many of the questions, when cross-tabulated with the amount of research respondents' had carried out each week during the semester was not sufficiently clear to give transparent outcomes. However, a number of the tables (Tables 51, 52, 54, 55, 56, 58 and 59) either gave clear evidence, or enough indicative evidence to suggest that the hypothesis proposed above is not supported and that the amount of research activity conducted by an academic at ECU did not appear to influence their usage of EJs at the time the survey was conducted.

5.6 Differences in the Usage of EJs by Level of Internet Experience

Pullinger's (1999) study of United Kingdom academics correlated a high usage of the Internet (94 percent of respondents used the Internet at least weekly) with a high level of usage of EJs, with just over 54 percent reporting using EJs at least weekly.

Therefore, the current research study set out to test the hypothesis that academics who classified themselves as having advanced experience in using electronic networks, such as the Internet, would be the heaviest users of EJs and demonstrate a greater interest, awareness of or disposition to use them both in the past and in the future than other ECU academics.

Table 60 below presents the margins of error that were calculated and used to analyse Tables 61 to 70.

Table 60 Margins of Error for Level of Internet Experience

Age	Sample Size (percent)	Margin of Error (percent)
Beginner	47 (23)	15
Intermediate	82 (40)	9
Intermediate to Advanced	50 (24)	14
Advanced	27 (13)	19
Other[101]	1 (0)[102]	- -[103]
Total	207	

[101] The respondent who chose 'other' did not give any details to enable an interpretation of what 'other' represented.
[102] Actual percentage equals 0.4%
[103] The 'margin of error' formula cannot be used on a sample size of 1 respondent. While the results for the respondent who chose 'other' is reported, it has not been analysed as it is insignificant.

Table 61 below reveals that Internet experience is *not* a factor that influenced whether or not the academic held a personal subscription to an EJ at the time the survey was conducted. The results in column 3, when compared to column 2, clearly demonstrates that all the Internet experience sub-groups have substantially tended to not hold subscriptions to EJs and thus the hypothesis proposed above is not supported.

Table 61 Level of Internet Experience Cross Tabulated with Personal Subscriptions to EJs (Questions 8 and 10)

	Personal Subscriptions to EJs			Total (percent)
	Yes (percent)[104]	No (percent)	Depends (percent)	
Internet Experience				
Beginner	4 (9)	43 (91)	0 (0)	47 (100)
Intermediate	14 (17)	68 (83)	0 (0)	82 (100)
Intermediate to Advanced	9 (18)	41 (82)	0 (0)	50 (100)
Advanced	8 (30)	19 (70)	0 (0)	27 (100)
Other	0 (0)	1 (100)	0 (0)	1 (100)
Total	35	172	0	207

[104] Note: All percentages in Tables 60 to 69 are rounded to the nearest whole number for presentation in the tables. While the unrounded figures total 100 percent, the rounding process may affect the total. Where this happens and the rounded figures total more or less than 100 percent, this will be noted and the figure in the last column rounded to 100 percent.

Table 62 below demonstrates that for two Internet experience sub-groups (Beginner and Intermediate) their respondents tended to *not* cite EJ articles in their own work at the time the survey was conducted. While the results for the other two sub-groups is not clear, once the margin of error was considered, it is interesting to note that 'Advanced' Internet users were not heavy citers of EJ articles, which does not support the hypothesis outlined above.

Table 62 Level of Internet Experience Cross Tabulated with Citing EJ Articles in Own Work (Questions 8 and 12)

	Citing EJ Articles in Own Work			Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	
Internet Experience				
Beginner	14 (30)	33 (70)	0 (0)	47 (100)
Intermediate	33 (40)	49 (60)	0 (0)	82 (100)
Intermediate to Advanced	25 (50)	25 (50)	0 (0)	50 (100)
Advanced	14 (52)	13 (48)	0 (0)	27 (100)
Other	0 (0)	1 (100)	0 (0)	1 (100)
Total	86	121	0	207

Table 63 below presents the results when Internet experience is cross-tabulated with the academics' intention to cite EJ articles in the future. A statistically significant majority of respondents in all sub-groups, when the margin of error was considered, demonstrated a clear intention to cite EJ articles in the future at the time the survey was conducted. As there is no difference between the sub-groups, this result does not therefore support the hypothesis outlined above.

Table 63 Level of Internet Experience Cross Tabulated with Citing EJ Articles in the Future (Questions 8 and 13)

	Citing EJ Articles in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer to Question 13 (percent)	
Internet Experience					
Beginner	30 (64)	3 (6)	14 (30)	0 (0)	47 (100)
Intermediate	68 (83)	1 (1)	13 (16)	0 (0)	82 (100)
Intermediate to Advanced	43 (86)	1 (2)	5 (10)	1 (2)	50 (100)
Advanced	20 (74)	1 (4)	6 (22)	0 (0)	27 (100)
Other	1 (100)	0 (0)	0 (0)	0 (0)	1 (100)
Total	162	6	38	1	207

Table 64 below coupled with the results from Tables 61 and 62 above, strengthens the assertion that the hypothesis proposed above was not supported by the behaviour of academics at ECU at the time the survey was conducted. Column 3 of Table 63 presents a statistically significant majority of respondents in all sub-groups, when the margin of error was considered, had *not* submitted articles to EJs. 'Advanced' users of the Internet were no more likely to *not* submit an article to an EJ than an ECU academic 'Beginner' user of the Internet.

Table 64 Level of Internet Experience Cross Tabulated with Submission of Articles to EJs in the Years 1994 to 1998 (Questions 8 and 15)

	Submission of Articles to EJs			Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	
Internet Experience				
Beginner	3 (6)	44 (94)	0 (0)	47 (100)
Intermediate	9 (11)	73 (89)	0 (0)	82 (100)
Intermediate to Advanced	4 (8)	46 (92)	0 (0)	50 (100)
Advanced	4 (15)	23 (85)	0 (0)	27 (100)
Other	0 (0)	1 (100)	0 (0)	1 (100)
Total	20	187	0	207

For comparison Table 65 below is provided. Table 65 demonstrates that when Internet experience is correlated with ECU academics' behaviour in submitting articles to paper-based journals a different scenario emerges. While the results for one of the sub-groups (Beginner) was not clear, once the margin of error was considered, the three sub-groups (Intermediate; Intermediate to Advanced and Advanced Internet users) were all statistically significant publishers in paper-based journals. This suggests that academics at ECU who had published at the time the survey was conducted had a clear preference to

publish in paper-based journals over EJs, and this is not influenced by the level of their experience in using the Internet.

Table 65 Level of Internet Experience Cross Tabulated with Submission of Articles to Paper-based Journals (Questions 8 and 14)

	Submission of Articles to Paper-based Journals			Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	
Internet Experience				
Beginner	24 (51)	23 (49)	0 (0)	47 (100)
Intermediate	62 (76)	20 (24)	0 (0)	82 (100)
Intermediate to Advanced	36 (72)	14 (28)	0 (0)	50 (100)
Advanced	24 (89)	3 (11)	0 (0)	27 (100)
Other	0 (0)	1 (100)	0 (0)	1 (100)
Total	146	61	0	207

Unfortunately, the results for Table 66 below are not straightforward. 'Beginner' users of the Internet demonstrate a clear intention to *not* submit articles to EJs in the future, at the time the survey was conducted. However, when the margin of error was considered, the results for the other three sub-groups (Intermediate; Intermediate to Advanced and Advanced Internet users) did not clearly indicate the respondents' intentions.

For previous research questions it has been assumed that if the respondents chose 'Depends' and largely ignored 'No' then it would be reasonable to postulate that if the reasons for respondents choosing 'Depends' were negated then it was possible to assume they might move to become 'Yes' respondents. While it is noted that the numbers in the 'no' column of Table 66 has considerable respondents, if the 'Depends'

respondents are moved to 'Yes' respondents the results remains inconclusive for two of the sub-groups (Intermediate and Advanced). As such, this question would benefit from being re-tested on a larger sample to gain more valid results.

When compared to previous publishing activity in Table 64 above, Table 66 below does indicate that experienced Internet users did not have a clear preference to publish in EJs over paper-based journals, at the time the survey was conducted, and as such did not demonstrate a greater interest or disposition to use EJs than did other ECU academics.

Table 66 Level of Internet Experience Cross Tabulated with Intention to Submit Articles to EJs in the Future (Questions 8 and 17)

	Submission to EJs in the Future				Total (percent)
	Yes (percent)	No (percent)	Depends (percent)	No Answer to Question 17 (percent)	
Internet Experience					
Beginner	8 (17)	23 (49)	13 (28)	3 (6)	47 (100)
Intermediate	24 (29)	36 (44)	22 (27)	0 (0)	82 (100)
Intermediate to Advanced	19 (38)	14 (28)	17 (34)	0 (0)	50 (100)
Advanced	7 (26)	10 (37)	10 (37)	0 (0)	27 (100)
Other	0 (0)	1 (100)	0 (0)	0 (0)	1 (100)
Total	58	84	62	3	207

'Neutral' or 'No opinion' was the belief of choice regarding EJs having poor or inconsistent quality articles for a statistically significant majority for three Internet experience sub-groups (Beginner; Intermediate and Intermediate to Advanced) at the time

the survey was conducted, as Table 67 below illustrates. Unfortunately, the result for the 'Advanced' sub-group was not sufficiently clear to reach a strong conclusion. However, the results are sufficiently clear to state that the hypothesis outlined earlier is not supported.

Table 67 Level of Internet Experience Cross Tabulated with Belief that most EJs have Poor or Inconsistent Quality Articles (Questions 8 and 25)

	EJs have Poor or Inconsistent Quality Articles						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer to Question 25 (percent)	
Internet Experience							
Beginner	2 (4)	5 (11)	34 (73)	6 (13)	0 (0)	0 (0)	47 (100)
Intermediate	3 (4)	8 (10)	56 (68)	14 (17)	0 (0)	1 (1)	82 (100)
Intermediate to Advanced	1 (2)	8 (16)	29 (58)	11 (22)	1 (2)	0 (0)	50 (100)
Advanced	1 (4)	6 (22)	12 (44)	8 (30)	0 (0)	0 (0)	27 (100)
Other	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	0 (0)	1 (100)
Total	7	27	132	39	1	1	207

'Intermediate' and 'Intermediate to Advanced' ECU academic Internet users tended to regard the statement "Publishing in academic electronic journals does not contribute to promotion or tenure" either neutrally or with no opinion at the time the survey was conducted, as demonstrated in Table 68 below. The results for the 'Beginner' and 'Advanced' sub-groups were not sufficiently transparent to interpret. However, it is also noted that a considerable number of Beginners were neutral about this statement. However, the results are sufficiently clear to state that the hypothesis outlined earlier is not supported.

Table 68 Level of Internet Experience Cross Tabulated with Belief that Publishing in EJs Does Not Contribute to Promotion or Tenure (Questions 8 and 29)

	Publishing in EJs does not Contribute to Promotion or Tenure						Total (percent)
	Strongly Agree (percent)	Agree (percent)	Neutral/ No opinion (percent)	Disagree (percent)	Strongly Disagree (percent)	No answer to Question 29 (percent)	
Internet Experience							
Beginner	0 (0)	10 (21)	22 (47)	15 (32)	0 (0)	0 (0)	47 (100)
Intermediate	1 (1)	13 (16)	43 (52)	21 (26)	3 (4)	1 (1)	82 (100)
Intermediate to Advanced	0 (0)	7 (14)	28 (56)	12 (24)	2 (4)	1 (2)	50 (100)
Advanced	0 (0)	9 (33)	6 (22)	11 (41)	1 (4)	0 (0)	27 (100)
Other	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	0 (0)	1 (100)
Total	1	39	99	60	6	2	207

'Beginner' ECU Internet academic users clearly tended to never use EJs when researching a new topic at the time the survey was conducted, as Table 69 below illustrates. Unfortunately, the results for the other three sub-groups (Intermediate; Intermediate to Advanced and Advanced users) were unclear and did not demonstrate a

clear majority behaviour for the respondents. However, it is interesting to note that the results do not show 'Advanced' Internet users 'Always' or 'Usually' using EJs when researching a new topic which provides evidence that the hypothesis proposed above is not supported.

However, while the results in Table 69 may not be sufficiently clear for interpretation, it is again important to note that considerable numbers of ECU's researchers either never or rarely consult EJs when researching a new topic. This is a result worthy of further investigation by ECU's librarians.

Table 69 Level of Internet Experience Cross Tabulated with Usage of EJs when Researching a New Topic (Questions 8 and 34)

	Respondent Searches EJs when Researching a New Topic						Total (percent)
	Always (percent)	Usually (percent)	Some of the time (percent)	Rarely (percent)	Never (percent)	No answer to Question 34 (percent)	
Internet Experience							
Beginner	0 (0)	8 (17)	9 (19)	14 (30)	16 (34)	0 (0)	47 (100)
Intermediate	4 (5)	21 (26)	24 (29)	19 (23)	14 (17)	0 (0)	82 (100)
Intermediate to Advanced	8 (16)	10 (20)	11 (22)	11 (22)	9 (18)	1 (2)	50 (100)
Advanced	5 (19)	6 (22)	6 (22)	6 (22)	4 (15)	0 (0)	27 (100)
Other	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	1 (100)
Total	17	45	50	50	44	1	207

Table 70 below presents the results for when the level of Internet experience for ECU academic respondents was cross tabulated with their usage of EJs to keep in touch with topics associated with areas in which they taught or held qualifications at the time the survey was conducted. A statistically significant majority of 'Beginner' and

'Intermediate' Internet users either 'Rarely' or 'Never' used EJs for this purpose. While the results for 'Intermediate to Advanced' and 'Advanced' respondents, once the margin of error was considered, did not show a clear trend one way or the other it remains interesting to note that 'Advanced' Internet users did not regularly use EJs to keep in touch with topics in which the academic taught or held qualifications.

Table 70 Level of Internet Experience Cross Tabulated with Reading EJs to Keep in Touch with Topics Associated with Areas in which the Academic Teaches &/or has Qualifications (Questions 8 and 35)

	Usage of EJs to Keep in Touch with Topics Associated with Areas in Which the Academic Teaches &/or has Qualifications						Total (percent)
	Always (percent)	Usually (percent)	Some of the time (percent)	Rarely (percent)	Never (percent)	No answer to Question 35 (percent)	
Internet Experience							
Beginner	0 (0)	5 (11)	11 (23)	13 (28)	17 (36)	1 (2)	47 (100)
Intermediate	3 (4)	10 (12)	35 (43)	20 (24)	14 (17)	0 (0)	82 (100)
Intermediate to Advanced	7 (14)	3 (6)	21 (42)	8 (16)	11 (22)	0 (0)	50 (100)
Advanced	3 (11)	4 (15)	5 (19)	11 (41)	4 (15)	0 (0)	27 (100)
Other	0 (0)	0 (0)	0 (0)	0 (0)	1 (100)	0 (0)	1 (100)
Total	13	22	72	52	47	1	207

Tables 61 to 70 provide sufficient evidence to disprove the hypothesis that academics who considered themselves as having advanced experience in using electronic networks, such as the Internet, would be the heaviest users of EJs and demonstrate a greater interest, awareness of or disposition to use them both in the past and in the future than other ECU academics. The level of Internet experience of an ECU academic did not appear to influence their usage of EJs at the time the survey was conducted.

5.7 Conclusions

The current study sought to discover if certain factors such as:

1. Faculty;
2. Gender;
3. Age;
4. Amount of time since last qualification;
5. Amount of research activity; and
6. Level of Internet experience.

could be shown to influence an academics' usage of EJs at ECU.

Overwhelmingly, when the results from the survey were analysed, the results suggested that these factors did *not* influence ECU faculty members, usage or attitudes towards EJs.

When each of the different factors was correlated with personal subscriptions to EJs, in no instance was there a relationship between the factor and the academic's behaviour in holding a personal subscription to an EJ. As such, it can be claimed that none of the factors researched influenced whether or not an ECU faculty member would be more or less likely to hold a personal subscription to an EJ at the time the survey was conducted.

When the results for each of the different factors was correlated with the academics' past and present behaviour in citing EJs in their own work at the time the survey was conducted, no clear pattern emerged and this question would benefit from being re-tested on a larger sample to gain valid results.

However, when respondents were asked about their *intention* to cite articles in the future, at the time the survey was conducted, valid results were achieved for each of the six factors. Again a similar result was obtained for each, and no single factor appeared to influence an academic's intention to cite EJ articles in the future.

No single factor produced a different outcome when correlated with respondents' past and present behaviour in submitting articles to EJs at the time the survey was conducted. Across the board, ECU academics had tended not to send the product of their research endeavours to EJs.

When ECU's academics were asked about their intention to submit articles to EJs in the future, at the time the survey was conducted, the results across all the factors were unclear, signalling that no factor researched in this study influenced decisions in this regard. It would be useful if this question were re-tested on a larger sample to gain valid results.

When the six factors were correlated with ECU academics' response to the statement that EJs have poor or inconsistent quality articles, again across all the factors respondents were consistently neutral or had no opinion regarding the statement, at the time the survey was conducted.

The results for respondents' belief that publishing in EJs did not contribute to promotion and tenure were unclear, at the time the survey was conducted, when correlated with all the factors and would benefit from being re-tested on a larger sample to gain authoritative results.

No clear results were obtained when each factor was correlated with asking respondents if they used EJs when researching a new topic, at the time the survey was conducted, and as such should be re-tested on a larger sample to gain valid results. It was noted however, that the large number of respondents who indicated that they 'Rarely' or 'Never' used EJs in their research would be of special interest to ECUs librarians and

worthy of their investigation.

When the factors for Faculty, Gender and Amount of Research Activity were correlated with respondents' behaviour regarding the use of EJs in keeping in touch with topics in which they taught or held qualifications, the results conclusively demonstrated that at the time the survey was conducted, respondents did not use them for that purpose and again revealed that no tested factor appeared to be influencing their behaviour.

The results from this study indicate that none of the factors tested have influenced academics' usage of EJs at ECU.

Tomney and Burton's (1998) and Pullinger's (1999) studies on academics usage of EJs indicated that local factors influenced the adoption and usage of electronic library services such as EJs. Local factors identified included:

- How comprehensively EJs had been promoted;
- The accessibility of the academics' library, including its opening hours, the distance the academic would have to go to visit the library; centralised versus de-centralised journal collections;
- The amount or frequency of guidance or support given to academics; and
- How extensive were the academic's library's paper-based journal holdings.

This research may indicate that while the factors researched in this study conclusively did *not* influence academics at ECU's usage of EJs, at the time the survey was conducted, there may have been other aspects such as local factors, untested by this study, influencing their behaviour.

Section 3.2.2 outlined how ECU's librarians had not instituted a formal training plan for ECU's academics to learn how to use the Internet (L. Leslie, personal communication, June 24, 2001) nor EJs, before or during the time the study was conducted. ECU's library had also allocated 30 percent of its collections and access

budget to digital resources which included EJs in 1998 and by 2000 full text web resource titles were being added to the library's catalogue (L. Leslie, personal communication, June 24, 2001). Speculating on Tomney and Burton's (1998) and Pullinger's (1999) studies, this may mean that a significant portion of ECU's library collection was being underused at the time the survey was conducted as EJs had not been extensively promoted nor was there much training, guidance or support given to ECU academics to use them.

These and other local factors may have influenced an ECU academic's usage of EJs rather than the six factors proposed by this study.

CHAPTER 6

TOTAL SURVEY RESULTS BY QUESTION: ANALYSIS AND DISCUSSION

Chapter 5 presented the analysis of this study's survey results in relation to the six hypotheses posed in Sections 3.3.1 to 3.3.6. This Chapter sets out to analyse the results of the survey (Appendix B), as a whole, analysing the results for each survey question and also providing the results for the twenty research questions posed in Section 3.3.7.

The survey's results are analysed using the margin of error statistical formula (Niles, c.1996b):

> Margin of error = 1 divided by the square root of the number people in the sample (or sub-group).

Which for the present study equates to being:

> Margin of error = 1 divided by the square root of 207 [105]
> Margin of error = 7% [106]

The results of each question were analysed using the sample's margin of error (the margin of error plus and minused from the original number). If the figures did not overlap the results were then analysed. If the figures overlapped, the results were deemed to be insufficiently clear to make reasonable conclusions. The steps taken use the margin of error is outlined in Section 4.9.

[105] The square root of 207 equals 14.387494.
[106] The actual number is 0.0695048, which is rounded to 7 percent.

6.1 Gender of Respondents

Table 6, Section 4.10 provides the results the survey obtained by gender.

6.2 Age

Respondents were asked to give their age with the results presented in Table 28 in Section 5.3. The results from this table were correlated with the nine survey questions outlined in Section 5, with the analysis given in Section 5.3.

6.3 Amount of Time since Last Qualification was Conferred

The amount of time passed since the respondents' last qualification was conferred was asked, with the results given in Table 39 in Section 5.4 above. The results from this table were correlated with the nine survey questions outlined in Section 5, with the analysis given in Section 5.4.

6.4 Respondents' Job Title

Respondents were asked to indicate their job title with the results presented in Table 3 in Section 3.2.

6.5 Faculty of Respondents

Respondents were asked to indicate the Faculty to which they belonged, with the results given in Table 8 in Section 5.1 above. The results from this table were correlated with the nine survey questions outlined in Section 5, with the analysis given in Section 5.1.

6.6 Hours Spent on Research Activities

The questionnaire asked respondents to specify the number of hours per week they spent on research activities during their semester. The results were aggregated into five categories, the results of which can be seen in Table 49 in Section 5.5 above. The results from this question were correlated with the nine survey questions outlined in Section 5, with the analysis given in Section 5.5.

6.7 Hours Spent on Teaching and Preparation Related Activities

Respondents were also requested to indicate the number of hours per week they spent on teaching and preparation-related activities during the semester. The results were aggregated into six categories, with the results from this question presented in Table 71 below.

Table 71 **Please Indicate Approximately How Many Hours per Week You Spend on Teaching and Preparation Related Activities during the Semester**

Hours Spent on Teaching and Preparation Related Activities	Frequency	Percent
Nil	12	5.8
Less than & including 5 hours	9	4.3
More than 5 hours and less than and including 10 hours	26	12.6
More than 10 hours and less than and including 20 hours	48	23.2
More than 20 hours and less than and including 40 hours	85	41.1
More than 40 hours	17	8.2
No answer	10	4.8
Total	207	100

The Researcher acknowledges that the results derived from this question are not used in the analysis presented in this study. This is due to the elapsed time between when the questionnaire was given to ECU's academics and the analysis taking place. During this time the Researcher tightened the focus of the study and the question became surplus.

6.8 Internet Experience

Respondents were asked to rate their experience using electronic networks, such as the Internet, using a 4 point scale from beginner to advanced, with the results

from this question given in Table 60 in Section 5.6 above. An 'Other' category was also provided, with respondents choosing this response asked to specify what 'Other' represented. This response was chosen by one respondent who did not indicate what 'Other' represented to them.

The results from this question were correlated with the nine survey questions outlined in Section 5, with the analysis given in Section 5.6.

Clayton (1999) reported on the results of a stratified random sample of Internet use by academics in Australia. Of the 539 responses, 20 percent considered themselves to be beginner, 55 percent considered themselves competent and 10 percent claimed to be expert. Clayton also gave a 'non-user' category, which was selected by 5 percent of respondents. It is noted that the categories used by Clayton and the results achieved match satisfactorily with the results in the current study. Clayton provided a 'non-user' category, which the current study failed to do and would be a useful inclusion for future similar research studies. Clayton's study reported on research carried out in 1997 and it is interesting to note that the level of ECU academics' skill in using the electronic networks such as the Internet had not generally changed from the levels reported by Australian academics two to three years previously.

6.9 Internet Training

Table 72 below uncovers that the majority of academics at ECU had not attended an Internet training course, confirming Leslie's (personal communication, June 24, 2001) information that at the time of the study ECU's librarians had not established a formal Internet training programme for faculty. It is possible that a lack of skills in using the Internet may have had a flow on effect leading to a lack of skills or willingness for ECU's academics to use EJs. This may be a local factor influencing the results presented in Chapter 5.

Respondents who had attended an Internet training course were asked how long ago it had been. Fifty-three of the 76 respondents who had attended an Internet training course gave the following time frame:

- Within the same year as the survey - 13 respondents;
- Within 2 years - 15 respondents;
- Within 3 years – 10 respondents;
- Within 4 years – 3 respondents;
- Within 5 years – 9 respondents; and
- 6 plus years – 3 respondents.

Respondents also offered a number of comments on the quality of the training they had received, including "it was so badly conducted that I ended up training myself" and "bad teaching style-inadequate opportunities for hands-on". At the time the survey was conducted the Researcher was not aware that ECU's librarians did not provide formal training for their academics. Asking respondents about the source and extent of their Internet training would have been an interesting avenue to explore and may have provided some ideas for ECU's librarians to consider. A number of respondents also indicated that they needed to either receive training or have access to refresher courses; "I need another one".

Table 72 Have You Attended an Internet Training Course?

Internet Training	Frequency	Percent
Yes	76	36.7
No	131	63.3
Total	207	100

6.10 Personal Subscriptions to EJs

Respondents were asked if they personally subscribed to any EJs, with the results given in Table 73 below. Column 3 clearly demonstrates that the majority of ECU academics do not subscribe to EJs.

Of the 35 respondents choosing 'Yes', 25 specified how many titles they subscribed to:

- 1 title was subscribed to by 10 respondents;
- 2 titles were subscribed to by 5 respondents;
- 3 titles were subscribed to by 3 respondents;
- 4 titles were subscribed to by 4 respondents;
- 6 titles were subscribed to by 2 respondents; and
- 10 titles were subscribed to by 1 respondent.

A few respondents were concerned about the cost of EJs and one respondent noted their concern with losing access once a subscription ends; "concerned about loss of investment in cases of annual subscription caeses [sic]".

A number of other issues dominated the reasons why academics had not subscribed to EJs including:

- A clear preference for paper-based journals, "use hard copy only";
- A clear preference for using the library, "because I like libraries. I like the atmosphere";
- A lack of suitable EJs in their field, "few electronic journals in my field of interest"; and

- A lack of skills to access EJs, "ignorance and time", and "need to find out how the system works".

These issues highlight the need for training to be given to ECU academics to learn how to use EJs, but also for ECU's librarians to ensure academics are aware of titles available to them.

As noted in Section 1.2 this study was driven by the concern that many librarians were replacing subscriptions to print journals with subscriptions to EJs without giving consideration to the impact this may have on clients both now and in the future. The study uncovered ample evidence to suggest that ECU's librarians had introduced EJs without ensuring their clients were consulted throughout the process nor given the training necessary to be able to use the new media.

Table 73 Do You Personally Subscribe (Free or Paid) to Any Academic Electronic Journals?

Personal Subscriptions to EJs	Frequency	Percent
Yes	35	16.9
No	172	83.1
Total	207	100

6.11 Reading EJs

Question 11 invited respondents to choose the corresponding behaviour that would most accurately describe the way the Academic would read EJ articles. Responses are set out in Table 74 below.

Similarly to Tomney and Burton's (1998) results, this study had fewest respondents choosing to only read EJ articles online, whereas, once the margin of error was considered, there was no statistical significant difference between respondents choosing to *only* printout EJ articles to read and those who preferred to read EJ articles on-screen and then make copies. This contrasted with the results from Berge and Collins (1996), Schauder (1994) and Stewart (1996). One possible reason for the current results diverging from the earlier studies is that respondents appear to be using many more different ways to use or capture information from the Internet or EJs then they may had used previously, perhaps indicating an increase in technical skills for some academics. As one respondent commented, "I read some on screen only, I print some of them if they interest me", whereas another respondent who indicated they did not read EJ articles on-screen stated, "I don't like reading from computers". Another respondent who chose 'Other" indicated they "browse article[s] online – v. [very] good then print; if average save to file; [I] ignore others". These comments give a small indication into the wide range of methods in which EJs are physically used by respondents.

Table 74 Methods of Reading and Capturing EJ Articles

Reading EJs	**Frequency**	**Percent**
Only read articles on-screen from EJs	8	3.9
Only print out interesting articles and then read them	85	41.1
Read articles on-screen & make copies to read later or keep	103	49.8
Other	5	2.4
No answer	6	2.9
Total	207	100[107]

[107] The actual figure is 100.1 percent which becomes 100 percent when rounded for presentation in the table.

6.12 Cited EJs in own work

Question 12 sought to discover respondents' behaviour in citing EJs in their own work with the results presented in Table 75 below.

Berge and Collins' (1996) survey of readers of IPCT-J found that 14.2 percent of respondents had cited IPCT-J articles in their work. Harter's (1996; 1998) citation analysis studies indicated that EJs were not being heavily cited by academics.

The current study supported these results. A statistically significant majority of respondents, once the margin of error was considered, had *not* cited EJs in their work. However, it is interesting to note a considerable number (41.5 percent) of respondents *had* cited EJs in their work. While not in the majority, this may indicate a growing acceptance of EJs compared to Harter's (1996; 1998) results. Of course, it may also indicate Academics at ECU had been forced to cite EJs in their work where their print journal subscriptions had been cancelled by ECU's librarians and substituted with EJs.

Most respondents, who replied in the negative and provided comments, stated they had not cited EJ articles because they had not used EJs or there were no relevant EJs in their field. Other comments included:

- "Most electronic journals have hard copy that I am interested in";
- "They are not top class publications as yet";
- "I don't research that way";
- "I like real hard copies"; and
- "I don't normally look at electronic journals";

Those who responded in the affirmative also did so for a number of reasons

including:

- "Not available in another form";
- "Recency of information, trusted source";
- "I believe they [EJs] are up-to-date and have their 'finger on the pulse' of critical contemporary issues";
- "To extend my research horizons"; and
- "The article [I] wanted was in this form [EJ] – i.e. it is the article that is important not the method of accessing".

A number of respondents who stated that they had cited EJs in their own work remained concerned about the medium, "yes -but not confident about a) reference protocols, b) stability of website".

The above comments confirm the suggestion that a number of academics were being forced to use EJs, even if it was not their preferred medium or they were missing out on accessing all the available research due to their reluctance or refusal to use EJs. It is interesting to note however, that a significant number of ECU academics had cited EJs in their own work by 2000. As the comments above suggest, this may be due to a number of reasons including:

- They were forced to use them, either by ECU or the publisher substituting their paper copy with an electronic one;
- They were acquiescing to EJs becoming inevitable; or
- A positive acknowledgement of the potential benefits of EJs such as their currency.

Table 75 Have You Cited Articles from Academic Electronic Journals in Your Own Work?

Cited EJs in own work	Frequency	Percent
Yes	86	41.5
No	121	58.5
Total	207	100

6.13 Intention to Cite Articles from EJs in the Future

To gain an appreciation as to whether respondents had the *intention* to change their behaviour from the results discovered in Section 6.12, respondents were asked if they were open to citing articles from EJs in the future. The results for this question are given in Table 76 below.

Tomney and Burton's (1998) study of academics implied that over 80 percent intended using EJs in the future.

The results from the current study supported this finding with over 78 percent of respondents, at the time the study was conducted, indicating they intended to cite EJ articles in the future.

Just over 18 percent of respondents stated that citing EJs depended on other factors. Twenty of the 38 respondents who chose 'Depends' provided comments; these included:

- "If peer reviewed";
- "[Depends] on the quality";
- "I need training in how to access them" and

- "If I find relevant ones – which I haven't to date".

The majority of the 'Depends' comments focussed on three issues:

1. If the article was refereed;
2. If the article was relevant; and
3. The lack of skills/training of the respondent to either find or use EJs.

If these issues were addressed or satisfied, it could be assumed that many more academics at ECU would be prepared to cite EJ articles in the future.

Table 76 Would You Cite Articles from Academic Electronic Journals in the Future?

Cite Articles from EJs in the Future	Frequency	Percent
Yes	162	78.3
No	6	2.9
Depends	38	18.3
No answer	1	0.5
Total	207	100

6.14 Submission of Articles to Scholarly, Paper-based Journals

Question 14 was asked to gain an insight into academics' behaviour in submitting articles to paper-based journals and for comparison with Question 15. The results for this question are given below in Table 77 and clearly indicated that the majority of ECU academics submitted articles to print journals during 1994 to 1998 by a factor of almost 2 to 1.

Schauder's (1994) study discovered that 24 percent of respondents generally published two articles per year, with a further 20 percent publishing one article per year.

Respondents to this study were given the opportunity to indicate how many articles they published in the five years from 1994 to 1998:

- 47 respondents had published between 1 and 5 articles;
- 31 respondents had published between 6 and 10 articles;
- 14 respondents had published between 11 and 20 articles; and
- 3 respondents had published approximately 30 articles.

As not all respondents indicated how many articles they published it was not possible to compare the publishing behaviour of ECU academics with the results obtained by Schauder.

A number of respondents who had not published any articles from 1994 to 1998 provided comments as to why they had not. The majority of these comments centred on a lack of time, "overloaded with teaching commitments" and "to [sic] busy in preparing a new post grad[uate] course". However a couple of other reasons were also highlighted, "I write books and book chapters" and "just started [at ECU]".

Table 77 In the Years 1994-1998 have You Submitted Articles to Scholarly, Paper-based, Journals?

Submission of Articles to Scholarly, Paper-based Journals?	Frequency	Percent
Yes	146	70.5
No	61	29.5
Total	207	100

6.15 Submission of Articles to EJs

Question 15 followed the same line of questioning as Question 14 and asked respondents to indicate if they had submitted articles to EJs in the same period, 1994 to 1998, as in Question 14. The results for this question are presented in Table 78 below.

Tomney and Burton's (1998) study indicated that only a few of their respondents (8 percent) had submitted articles to EJs. Spieir et al. (1999) discovered that 60 percent of their respondents had never submitted an article to an EJ, a further 16 percent rarely submitted articles to EJs, with only 1 percent either frequently or intending to submit to EJs in the future.

The results from the current study corroborated the previous research. Table 78 below illustrates a majority of ECU academics had *not* submitted articles to EJs from 1994 to 1998.

Respondents who stated that they had submitted articles to EJs were asked to indicate how many this consisted of and responses ranged from 1 article (8 respondents), 2 articles (2 respondents), 4 articles (1 respondent), to a high of 5 articles (1 respondent).

Respondents were also given the opportunity to provide comments. No respondents who had published in EJs provided any comments, however a number of respondents who had not submitted articles did comment. These comments centred on four themes:

1. Preference for print journals, "I prefer print refereed journals";
2. Lack of time, "Time!!!!!"
3. Perceived lack of quality, "I am not sure about their [EJs] quality in my field"; and

4. Perceived lack of status, "Ejournals [sic] don't have enough status".

It should be noted that while the majority of comments from respondents to Question 14 focused on the lack of time to publish, remarks elicited by Question 15 generally centred on a clear preference for print journals.

Table 78 In the Years 1994-1998 have You Submitted Articles to Scholarly Electronic Journals?

Submission of Articles to EJs	Frequency	Percent
Yes	20	9.7
No	187	90.3
Total	207	100

6.16 Awareness of Own Articles Being Cited in EJs

Question 16 requested respondents to indicate if they were aware of their own work being cited in an EJ, with the results presented in Table 79 below.

Measuring the number of citations a published article receives is one measure of its impact on the research community (Harter, 1996; Fossmire & Yu, 2000). As Table 79 below demonstrates, the vast majority of ECU academics were not aware of their work being cited in an EJ at the time the survey was conducted. Three respondents provided comments and they all concerned a lack of skills in knowing how to discover if the respondents' work had been cited in an EJ, "wouldn't know how to find out".

It should be noted that the survey did not ask respondents if they were aware if articles they had published in print journals had been cited. As such, it was not possible to

discover if the reason ECU's academics were not aware of possible citations in EJs was due to:

- Their articles had not being cited;
- A lack of citation searching skills;
- A possible lack of interest;
- They did not care whether their articles were cited in EJs or not;
- They did not care whether their articles were cited in either print or EJs; and
- It may never have occurred to them that citations are a useful measure.

A number of the possibilities outlined above indicate other opportunities for professional education and training by ECUs librarians.

Table 79 Are You Aware of any of Your Own Articles being Cited in an Article in an Academic Electronic Journal?

Awareness of Own Articles Being Cited in EJs	Frequency	Percent
Yes	14	6.8
No	189	91.3
No answer	4	1.9
Total	207	100

6.17 Submission of Articles to EJs in the Future

Respondents were asked about their possible *future* behaviour regarding submitting articles to EJs, with the results from Question 17 presented in Table 80 below.

Speier et al.'s (1999) results indicated that 60 percent of their respondents never intended to submit an article to an EJ in the future, with only 1 percent either intending to submit an article in the future, or who had already submitted articles for publication in an EJ.

It appears that ECU's academics behaved differently at the time the study was conducted, to Speier et al.'s respondents. Table 80 below reveals there was no statistical significant difference between 'Yes' and 'No' respondents for this question, once the margin of error was considered, for ECU academics. Possible future EJ submitters from ECU range from a possible low of 21 percent to a possible high of 35 percent. This contrasts quite markedly with Speier et al.'s results. The number of ECU academics who never intended to submit an article to an EJ ranged from a possible low of 33.6 percent to a possible high of 47.7 percent. Speier et al. discovered a higher rate (60 percent) of respondents who never intended to submit to an EJ. The disparity could possibly be explained by Speier et al. only surveying business faculty in the United States, whereas the current study's sample was drawn from an Australian university and all ECU's Faculties.

Almost half of the respondents who chose 'Depends' provided comments. A number of themes emerged when the comments were analysed, including:

- Relevance of the EJ, "[depends] on the relevance of content of journals available electronically";
- Issues surrounding perceived quality, "If I can locate a quality electronic journal";
- Acceptance of EJs by colleagues for promotion and tenure, "ECU prefers print journal submissions", "Prestige? Acceptance by Uni[versity] colleagues as valid"; and
- Lack of skills, "[need] to find out how".

Table 80 At Present, Do You Intend to Submit Your Own Work for Publication in Academic Electronic Journals in the Future?

Submission of Articles to EJs in the Future	Frequency	Percent
Yes	58	28.0
No	84	40.6
Depends	62	30.0
No answer	3	1.4
Total	207	100

6.18 Ease of Subscription to EJs

Question 18 sought to discover respondents' attitude regarding ease of subscribing to EJs, with the results provided in Table 81 below.

Table 81 demonstrates that the majority of ECU academic respondents at the time of the study had no opinion regarding this statement. Interestingly, it should also be noted that there was no statistical significant difference, once the margin of error was considered, between those who strongly agreed or agreed with the statement and those who strongly disagreed or disagreed.

Comments from respondents who were neutral provided some insight into why this was the preferred option, "don't know, haven't subscribed to either" and "don't know anything about the process". This result is aligned with the results presented in Section 6.10, where it was discovered that the majority of ECU academics do not hold personal subscriptions to EJs and so would not be in a position to comment on the ease of subscribing to them.

Table 81 I Believe it is Easier to Subscribe to Academic Electronic Journals than Academic Paper-based Journals

Ease of Subscription to EJs	Frequency	Percent
Strongly agree	14	6.8
Agree	47	22.7
Neutral/No Opinion	107	51.7
Disagree	31	15.0
Strongly disagree	7	3.4
No answer	1	0.5
Total	207	100[108]

6.19 Ease of Obtaining Information Using EJs

Question 19 sought to discover if academics at ECU believed that they were able to find information they needed quickly using EJs at the time of the study.

Table 82 below presents the results of this question. Surprisingly, given that few ECU academics personally subscribed to EJs and generally did not cite them in their work, a statistically significant number of ECU respondents, once the margin of error was considered, believed they were able to find the information they needed quickly over those who disagreed or disagreed strongly with the statement.

Column 3 illustrates that a significant number of ECU academics were neutral to this statement, which is also to be expected given that a number of respondents indicated that they were not aware of EJs before completing the survey, or did not use them at the time of the study.

[108] The actual figure is 100.1 percent which becomes 100 percent when rounded for presentation in the table.

Respondents who were not able to quickly find the information they were looking for while using EJs, generally indicated that it was due to a lack of appropriate skills, "don't have good search strategies", or the lack of suitable EJ titles available, "not much available in my field of interest".

However, given the results presented in Section 6.12 above and Sections 6.34 to 6.37 below, where it was discovered the majority of ECU academics *had not* incorporated using EJs into their routine research and work habits, the results of this question appear to be an anomaly and its validity should be re-tested.

Table 82 I Obtain Information I Need Quickly Using Academic Electronic Journals

Ease of Obtaining Information Using EJs	Frequency	Percent
Strongly agree	21	10.1
Agree	60	29.0
Neutral/No Opinion	75	36.2
Disagree	39	18.8
Strongly disagree	9	4.3
No answer	3	1.4
Total	207	100[109]

6.20 Willingness to Publish in EJs

Question 20 was provided to gain an appreciation of academics' willingness to publish in EJs at the time of the study. The results in Table 83 below contrast strongly with the results in Section 6.17 above.

[109] The actual figure is 99.8 percent which becomes 100 percent when rounded for presentation in the table.

When asked about their *intention* to submit articles to EJs in the future, this study found there was no statistical significant difference between those who intended to submit future articles to EJs and those who did not intend to do so at the time of the study. Question 17 also possessed a large number of respondents who chose 'Depends' (30 percent) and Section 6.17 notes the range of issues that influenced academics' responses.

When respondents were presented with a 5 point scale ranging from strongly agree to strongly disagree, a more precise picture regarding ECU academics' attitudes towards submitting articles to EJs emerged. When responses that either strongly agreed or agreed with the statement were aggregated (13 percent plus 51.2 percent equalling 64.2 percent) it became statistically significant, once the margin of error was considered, over those who either disagreed or strongly disagreed (8.7 percent plus 1.4 percent equalling 10.1 percent) with the statement.

However, the exact reason for this outcome remains unclear. It could be illustrating there is a difference in ECU academics' *intention* versus their *willingness* to submit articles to EJs – therefore due to the survey's use of language. Or it could be that by providing a 5 point scale rather than a simple yes/no/depends choice model, more accurate results have been obtained.

Certainly, this question should be re-tested to gain a clearer understanding regarding the variation in responses to question 17 and 20.

Respondent comments suggested a range of issues:

- Their usefulness for promotion and tenure/access to research funds, "RAI points?" and "not until they become accepted as an equal form of publishing';
- A concern for the peer review process, "only if refereed"; and

- A concern with plagiarism, "problems with piracy of content" and "some concern with plagiarism";

Table 83 I am Willing to Publish My Own Research in Academic Electronic Journals

Willingness to Publish in EJs	Frequency	Percent
Strongly agree	27	13.0
Agree	106	51.2
Neutral/No Opinion	50	24.2
Disagree	18	8.7
Strongly disagree	3	1.4
No answer	3	1.4
Total	207	100[110]

6.21 Status of Publishing in Paper Journals Versus EJs

The perceived lack of prestige in publishing in EJs was an outcome discovered through the literature review (Tomney & Burton, 1998). Question 21 therefore, sought to discover if this attitude was also held by ECU academics.

Table 84 below illustrates that a statistically significant majority of ECU academics, once the margin of error was considered, believed that publishing in print journals enjoyed more status than publishing in EJs at the time of the survey. As can be seen in Table 84, 53.6 percent of ECU academics either strongly agreed or agreed with the statement and only 17.4 percent either disagreed or strongly disagreed.

A number of key themes emerged from respondents' comments including:

[110] The actual figure is 99.9 percent which becomes 100 percent when rounded for presentation in the table.

- How 'status' is established, "Agree: The status of paper journals is built up over decades. The net is new";
- Refereeing, "Disagree: as long as peer reviewed"; and
- Quality is independent of medium, "Neutral: it depends on the journal not its form".

One respondent revealed a cynical attitude towards academic publishing; "I think the whole game of publishing is pretty mindless as it stands".

Table 84 I Believe Publishing in Paper Journals Has More Academic Status Than Publishing in Electronic Journals

Status of Publishing in Paper Journals Versus EJs	Frequency	Percent
Strongly agree	40	19.3
Agree	71	34.3
Neutral/No Opinion	59	28.5
Disagree	32	15.5
Strongly disagree	4	1.9
No answer	1	0.5
Total	207	100

6.22 Publishing in EJs is Faster Than Academic Paper-Based Journals

The literature review revealed that academics had a general belief that publishing in EJs should be faster than paper-based journals.

Question 22 therefore, sought to discover ECU academics' attitude regarding this question.

The results of the present survey supported Stewart's results, as can be seen from Table 85 below. At ECU, a statistically significant number of ECU academics, once the margin of error was considered, believed that publishing in EJs would be much faster than publishing in their paper-based counterparts at the time of the survey. As can be seen in Table 85, 41.6 percent of ECU academics either strongly agreed or agreed with the statement and only 6.3 percent either disagreed or strongly disagreed.

A number of respondents commented they did not have first hand knowledge if publishing in EJs was faster than paper journals; "I have no personal or second-hand experience of this". Given that Section 6.15 demonstrated that the majority of ECU academics have not submitted articles these comments and the high neutral/no opinion response (51.7 percent), are not surprising.

Table 85 I Believe the Publication of Articles in Academic Electronic Journals is much Faster than Academic Paper-based Journals (The Time it Takes from Submission to Publication)

Publishing in EJs is Faster than Academic Paper-based Journals	**Frequency**	**Percent**
Strongly agree	19	9.2
Agree	67	32.4
Neutral/No Opinion	107	51.7
Disagree	12	5.8
Strongly disagree	1	0.5
No answer	1	0.5
Total	207	100[111]

6.23 Wastage of Paper

Question 23 sought to discover respondents' attitude regarding the belief that EJs will possibly save paper.

Table 86 below indicates that respondents generally were evenly split between either strongly agreeing or agreeing (32.8 percent), being neutral (35.7 percent) or disagreeing or strongly disagreeing (30.9 percent) with the statement that EJs are preferred because they save large amounts of paper, with there being no statistical significant difference, once the margin of error was considered, between them.

However, respondent comments were quite insightful:

- "I'd probably printout articles before reading them, leading to lots of wastage. I can read a paper journal before photocopying";
- "not convinced that overall consumption is decreased as people will continue to printout";
- "We wade in paper despite the 'paperless office'";
- "But the work is less physically accessible. Publishing is not a waste of paper"; and
- "Energy consumption should be measured against paper consumption".

A number of respondents indicated that they understood that if they only printed out what they really needed, or saved them electronically they would save paper, but that wasn't their practice, "I could but I haven't", "only [print] to paper what is really wanted" and "if I was to use the e-copy would be better (greener)". A number of other respondents continued to indicate their strong preference for printed journals, "I spend

[111] The actual figure is 100.1 percent which becomes 100 percent when rounded for presentation in the

too much time at my computer. I like reading paper journals" and "preference for hard copies".

Table 86 I Prefer Academic Electronic Journals because there is no Wastage of Paper

Wastage of Paper	Frequency	Percent
Strongly agree	17	8.2
Agree	51	24.6
Neutral/No Opinion	74	35.7
Disagree	53	25.6
Strongly disagree	11	5.3
No answer	1	0.5
Total	207	100[112]

6.24 Convenience of Using EJs Versus Paper-Based Journals

The literature review (Section 2.2) revealed that one of the generally held perceived advantages of EJs is that they are generally more convenient, with academics being freed from accessing them only at the office or the library. Question 24 sought to check the validity of this perceived advantage.

Table 87 below demonstrates that this claim is not supported by ECU academics at the time of the survey. Once the results for those who strongly agreed and agreed were aggregated (30.4 percent) and contrasted with those who were neutral (36.2 percent) and the aggregated results for respondents who either disagreed or strongly

table.

[112] The actual figure is 99.9 percent which becomes 100 percent when rounded for presentation in the table.

disagreed (32.8 percent), and the margin of error was considered, ECU academics showed no clear belief that using EJs was more convenient than paper-based journals.

Comments from respondents also illustrated a range of differing views, clearly illustrating that while a number of academics found using EJs more convenient than paper journals, a great many did not at the time of the survey. A representative sample of comments included:

- "Agree because they are in your office";
- "Libraries and hard copy is limiting";
- "Not always, sometimes it is easier to read paper journals 'at a glance'";
- "I hate sitting for hours reading from a screen";
- "Easy to search, cut and paste quotes, store etc";
- "Should be easier but in reality, Electronic Journals are often not easy to get at, and are not presented as well as paper-based";
- "Viewing from office is great. Loss of "browse" of paper documents is a great loss"; and
- "Assuming you have the paper journal, you've just got it off the shelf".

A number of respondents again stated their strong preference for printed journals, "I still like to use the paper-based journals - I find them 'easier'" and "agree, but I prefer reading paper journals".

Table 87 I Find Using Academic Electronic Journals is more Convenient than Paper-based Journals

Convenience of using EJs Versus Paper-based Journals	Frequency	Percent
Strongly agree	23	11.1
Agree	40	19.3
Neutral/No Opinion	75	36.2
Disagree	57	27.5
Strongly disagree	11	5.3
No answer	1	0.5
Total	207	100[113]

6.25 Quality of Articles in EJs

The literature review identified that the perceived quality of articles in EJs was an issue for some academics.

The results for ECU academics is presented in Table 88 below and demonstrates that the majority of respondents held no opinion or were neutral regarding this issue (63.8 percent) at the time of the survey. Interestingly, there was no statistical significant difference, once the margin of error was considered, between those who agreed or strongly agreed with the statement and those who disagreed or strongly disagreed.

The difference between Speier et al.'s results and this study could be due to regional differences – Speier et al.'s respondents were drawn from American universities, or it could be due to local factors in ECU that have hampered ECU's academics using

[113] The actual figure is 99.9 percent which becomes 100 percent when rounded for presentation in the table.

EJs. As Tilbrook (1999a) outlined, ECU did not have a standard computing environment prior to mid 1998, there was no formal training programme for academics to learn to use the Internet (L. Leslie, personal communication, June 24, 2001) and by extension EJs, full-text EJ titles were not added to the library's catalogue until late 2000 – after this survey. These local factors provide some insight into the reasons why the majority of respondents held no opinion regarding the quality of EJ articles. As two respondents commented, "I haven't read enough of them [to comment]" and "don't read enough [EJs] to know".

Respondents who indicated they were familiar with EJs, often commented they found the quality of articles did vary, "very variable" and "those that I've come across so far have been inconsistent" and "it's certainly the case that some are of poor quality. On the other hand, some leading journals are now made available in print and electronically".

Table 88 I Believe Most Academic Electronic Journals have Poor or Inconsistent Quality of Articles

Quality of Articles in EJs	Frequency	Percent
Strongly agree	7	3.4
Agree	27	13.4
Neutral/No Opinion	132	63.8
Disagree	39	18.8
Strongly disagree	1	0.5
No answer	1	0.5
Total	207	100[114]

[114] The actual figure is 100.4 percent which becomes 100 percent when rounded for presentation in the table.

6.26 Refereeing of EJs

Question 26 sought to explore the importance of the peer-review process to academics regarding EJs. Schauder's (1994) study of Australian academics highlighted that 68 percent of respondents stated that refereeing articles was important and a further 23 percent of respondents held refereeing was of some importance.

The results of this survey supported Schauder's findings and are presented in Table 89 below. Almost 70 percent of ECU respondents either agreed or strongly agreed that EJs *must* be refereed for their articles to be taken seriously at the time of the survey. As one respondent noted "anything refereed is worth taking seriously". Interestingly, another respondent stated, "I tend to target refereed journals but this is not to say that non-refereed journals do not have quality".

Table 89 Academic Electronic Journal Articles Must be Refereed for Me to Take Them Seriously

Refereeing of EJs	Frequency	Percent
Strongly agree	70	33.8
Agree	74	35.7
Neutral/No Opinion	43	20.8
Disagree	20	9.7
Strongly disagree	0	0.0
Total	207	100

6.27 Archival and Historical Access for EJs

The literature review revealed that some academics were concerned about the

ephemeral nature of electronic archives and historical access for EJ articles.

The results from the current study supports the previous research outlined in Section 2.3.

Table 90 below illustrates that a statistically significant majority, once the margin of error was considered, of ECU academics were concerned about the archiving of EJs and their historical access (44.4 percent of respondents), over those who were not concerned (11.1 percent of respondents) at the time of the study.

As one respondent commented, "what will happen when computers change? Can one read old discs?" Another respondent gave the reason for their being concerned with long-term access to EJ articles as being "that's why I prefer publishing in paper". Yet another voiced their concern, "the issue of longtivity [sic] of existence is a critical issue to me for electronic journals. That is, if we quote them, will they be in existence 2-5 years down the track? If not there is no official record of their existence compared to a paper-based journal".

Table 90 I am Concerned about Archival and Historical Access for Academic Electronic Journal Articles

Archival and Historical Access for EJs	Frequency	Percent
Strongly agree	30	14.5
Agree	63	30.4
Neutral/No Opinion	91	44.0
Disagree	20	9.7
Strongly disagree	3	1.4
Total	207	100

6.28 Alteration of Articles in EJs

Respondents were questioned to discover if they held any concerns about the possible alteration of EJ articles after they were posted electronically.

Table 91 below presents the situation at ECU at the time of the survey. Analysing Table 91 provides an interesting outcome. A statistically significant number, once the margin of error was considered, of ECU academics held no opinion or were neutral regarding this issue, supporting Lancaster's results. However, a statistically significant number of academics, once the margin of error was considered, indicated they were concerned with this issue (33.3 percent who either strongly agreed or agreed with the statement) over those who indicated they were not concerned (17.8 percent who either strongly disagreed or disagreed).

Most of the comments provided by respondents to this question came from those who indicated they were neutral and their comments indicated they were either not aware of this issue or had not heard of it occurring, "never thought about it", "never heard of this happening".

Table 91 I Cannot be Completely Sure that any Article Appearing in an Academic Electronic Journal Has Not Been Altered Since Being Posted

Alteration of Articles in EJs	Frequency	Percent
Strongly agree	9	4.3
Agree	60	29.0
Neutral/No Opinion	100	48.3
Disagree	34	16.4
Strongly disagree	3	1.4
No answer	1	0.5
Total	207	100[115]

[115] The actual figure is 99.9 percent which becomes 100 percent when rounded for presentation in the table.

6.29 EJs and Promotion or Tenure

Schauder's (1994) survey of academics in Australia, United States and the United Kingdom, indicated that academics believed their university would give the same weight to publishing in EJs as publishing in print journals (35 percent of respondents), with a further 33 percent not knowing what their university's position was and 12 percent believed EJs would not be viewed favourably for promotion and tenure. Amiran et al. (1991) indicated that anecdotal reports suggested many academics believed publishing in EJs would contribute towards promotion and tenure.

Question 29 sought to discover ECU academics attitude concerning this issue, with the results given in Table 92 below.

Unlike Schauder's and Amiran et al.'s evidence, a statistically significant number, once the margin of error was considered, of ECU academics were neutral or held no opinion regarding this issue at the time of the survey. There was no statistical significant difference, once the margin of error was considered, between the results of those who agreed or strongly agreed with the statement (19.3 percent) and those who disagreed or strongly disagreed (31.9 percent). As noted above, Schauder surveyed academics from three countries, whereas the current survey only questioned academics from one Australian university. Different promotion and tenure practices in different countries or local factors at ECU, may explain the variant results.

Comments provided by ECU academics to this question ranged from the cynical, "disagree – nothing does at ECU"' to indicating the possible local factors that may have affected the result, "probably does, but qualifications i.e. PhD means more at [ECU at] the moment", "it's all RAI" and "it's too early to tell. It still depends upon the views of the assessors".

Table 92 Publishing in Academic Electronic Journals Does Not Contribute to Promotion or Tenure

EJs and Promotion or Tenure	Frequency	Percent
Strongly agree	1	0.5
Agree	39	18.8
Neutral/No Opinion	99	47.8
Disagree	60	29.0
Strongly disagree	6	2.9
No answer	2	1.0
Total	207	100

6.30 Stability of EJs

Question 30 was asked as a follow-on question from Question 27 (see Section 6.27 above) to gain a further understanding surrounding one of the issues that may concern Academics regarding EJs.

Table 93 below presents the results when respondents were asked their opinion if they considered EJs to be less stable than print journals.

The results supported the findings reported in Section 6.27 and a statistically significant number of ECU academics, once the margin of error was considered, believed that EJs were less stable than print journals. Fewer than 40 percent of respondents either strongly agreed or agreed with the statement in the survey versus only 11.6 percent who disagreed or strongly disagreed at the time of the survey.

While at first glance, Table 93 may appear to indicate that a majority of ECU academics were neutral to this question, it should be noted that there was no statistically

significant difference, once the margin of error was considered, between those who were neutral and respondents who agreed or strongly agreed. ECU academic opinion appeared to be fairly evenly divided.

A number of respondents who provided remarks indicated they thought EJs were still in their infancy and a pattern had not yet emerged, "too soon to tell", "it's likely, [though] for me it is too early to tell".

One respondent believed that "they [EJs] would have less overhead costs and therefore [are] easier to start up and close". Another thought that, "usually paper-based receives institutional backing". Numerous respondents stated that this was an issue they had not pondered, "never thought about it". One respondent thought that while EJs might currently be less stable than print journals they "could well improve in [the] future in this regard".

Table 93 Academic Electronic Journals are Less Stable than Paper Journals (May Start then Cease Suddenly)

Stability of EJs	Frequency	Percent
Strongly agree	9	4.3
Agree	71	34.3
Neutral/No Opinion	101	48.8
Disagree	24	11.6
Strongly disagree	0.0	0.0
No answer	2	1.0
Total	207	100

6.31 Eye Strain and Reading EJs

The literature review suggested that a major disadvantage of EJs was that reading them on-screen can be more fatiguing than reading paper.

Question 31 investigated this issue, with Table 94 below presenting the results. As can be seen, a clear majority of ECU academics (61.3 percent) believed that eye strain from reading EJs was an important issue at the time of the study, "it is a real problem". A number of passionate comments were made by respondents to this question, indicating the extent that current work loads for ECU academics that necessitate long periods reading at computer screens was a serious concern to many, "I spend all my time at computers now" and "we spend a lot of time at screen". One respondent wrote, "[I] would not even consider reading from the screen". A number of respondents commented that this issue was why they made paper printouts of items they wished to read, "that's why I'd probable [sic] make a hard copy of anything I'm interested in", "[I] don't read too much from the screen ([I] print)" and "having to scroll is not a nice way to refer to figures etc and hence I would probably print it out anyway". Another respondent voiced a related concern "the long-term effects of sitting in front of these screens are not known". On a serious note, a few respondents added that ergonomics was another major issue, "as a safety professional I believe that eye strain is a minor issue compared to ergonomics" and "along with ergonomic issues of computer use – RSI etc".

Table 94 I Believe Eye Strain From Reading Electronic Journal Articles is an Important Issue

Eye Strain and Reading EJs	Frequency	Percent
Strongly agree	40	19.3
Agree	87	42.0
Neutral/No Opinion	34	16.4
Disagree	38	18.4
Strongly disagree	8	3.9
Total	207	100

6.32 Serendipity and EJs

Table 95 below presents the results from the current study which interestingly contrasted strongly with Olsen's findings that academics believed there was a smaller possibility of stumbling upon useful articles by chance..

Over 66 percent of respondents either disagreed or strongly disagreed with the assertion that there was less chance for accidentally finding useful articles when using EJs at the time of the study.

The possible reasons for the differences from Olsen's research when compared with the current study include Olsen interviewed only forty-six academics and her research took place in the early the 1990s. The current study occurred in the last stages of the 1990s and early 2000 when possible changes in screen sizes, server speeds, ease of scrolling and improvements in search facilities, may all have contributed to ECU academics enjoying a different experience in serendipity and EJs than Olsen's academics.

Respondents who agreed with the statement generally lamented the loss of print journals and did not believe EJs could provide the same experience; "this is important for human-type social science academics who like to keep an eye on journals to the edge of, or even outside their field. It's much easier to skim a paper journal than an e-journal" and "I have found many good papers from just browsing paper journals. This is being lost now". Another respondent wrote; "[serendipity] is very important to me. It's much easier to browse a print library than an e-library. It affords you the opportunity to 'bump into' interesting articles you might not have seen otherwise - there is also a reason why all new journals must be displayed [respondent's emphasis] in the library".

Respondents who disagreed with the statement usually believed that the superior search techniques offered by electronic databases contributed to serendipity;

"search function would make it easier to find good stuff" and "this relates to the development of flexible search strategies".

A lack of search skills was also noted by respondents; "not yet proficient in searching".

Table 95 I Believe There is Less Chance for Accidentally Finding Useful Journal Articles When Using Academic Electronic Journals

Serendipity and EJs	Frequency	Percent
Strongly agree	15	7.2
Agree	40	19.3
Neutral/No Opinion	68	32.9
Disagree	74	35.7
Strongly disagree	7	3.4
No answer	3	1.4
Total	207	100[116]

6.33 Frequency of Reading EJs

Table 96 below presents the results from the current study when ECU academics were asked to indicate their pattern in using EJs. As can be clearly seen, over 55 percent of respondents reported reading EJs either 'Never' or 'Rarely'. This supports Rowley's report. Just over 6 percent of ECU academics stated they read EJs either 'always or 'usually' indicating that few had incorporated them into their normal research habits at the time the study was conducted.

When the results of Table 96 were compared to Table 73 in Section 6.10,

[116] The actual figure is 99.9 percent which becomes 100 percent when rounded for presentation in the table.

where just under 17 percent of respondents reported they held personal subscriptions to EJs, there is a noticeable discrepancy. However, throughout the survey many respondents indicated they did not have enough time to read and consider as many articles as they would like. Therefore the difference in the results from Questions 10 and 33 may be explained by the possibility that even though an ECU academic held a personal subscription to an EJ (and perhaps even to a print journal), they still may not have had the time to read it.

Respondents' comments noted some frustration in not being able to access EJs, "Although I have tried - ECU doesn't subscribe to the ejournals I'd like" and "I am unable to access them [EJs] without passwords etc". Other respondents commented they had no need to read EJs because, "paper journals provide what I need". Or, they weren't generally aware of EJs, "I don't know of any in my field". Or they lacked the skills in locating them, "a developing skill".

Table 96 Frequency of Reading Academic Electronic Journals

Frequency of Reading EJs	Frequency	Percent
Always	1	0.5
Usually	12	5.8
Some of the time	79	38.2
Rarely	70	33.8
Never	44	21.3
No answer	1	0.5
Total	207	100[117]

[117] The actual figure is 100.1 percent which becomes 100 percent when rounded for presentation in the table.

6.34 Use of EJs when Researching a New Topic

Question 34 enhanced the previous question, however instead of asking respondents how often they *read* EJs, Question 34 sought to discover if academics had incorporated using EJs when researching new topics.

Table 97 below demonstrates that a statistically significant number of ECU academics, once the margin of error was considered, either rarely or never used EJs (45.5 percent) when researching a new topic at the time of the survey, over academics who either always or usually used EJs (29.9 percent), or used EJs 'Some of the time' (24.2 percent).

However, when the results of the 'Always' and 'Usually' responses from Tables 96 and 97 are compared (6.3 percent and 29.9 percent respectively), it is interesting to note that academics' usage of EJs at ECU increased significantly when conducting research.

While no respondent who chose either 'Always' or 'Usually' provided comments, the other remarks written by respondents provided an insight into the research methods of ECU's academics, including:

- "I tend to use electronic searches first and then access the article if it is available electronically";
- "Usually not the journals individually but the f/t [full text] databases; and
- "I don't know - search engines may or may not search them. I use the engines!"

Other respondents noted they were not experienced in using EJs, "no way to do it that's in my comfort zone", or believed they may use them more frequently in the future, "more so in the future".

Table 97 I Search Academic Electronic Journals When Researching a New Topic

Use of EJs when Researching a New Topic	Frequency	Percent
Always	17	8.2
Usually	45	21.7
Some of the time	50	24.2
Rarely	50	24.2
Never	44	21.3
No answer	1	0.5
Total	207	100

6.35 Use of EJs to Keep in Touch with Topics in Which the Academic Teaches and/or Has Qualifications

Question 35 supplemented the previous two questions and asked respondents to indicate their usage of EJs regarding keeping in touch with topics connected with areas in which they taught or had qualifications.

Table 98 below demonstrates that a clear statistically significant number of respondents, once the margin of error was considered, either 'Rarely' or 'Never' (47.8 percent) used EJs for this purpose, compared with respondents who either 'Always' or 'Usually' (16.9 percent) used them to keep in touch with areas in which they taught or held qualifications at the time of the survey. As one respondent wrote, "I usually read paper journals for this".

It should be noted that Questions 33 to 35 present a consistent picture that a statistically significant number of ECU's academics generally were *not* incorporating EJs

into their routine reading and research habits at the time the study was conducted.

Table 98 I Read Academic Electronic Journals to Keep in Touch with Topics Associated with Areas in Which I Teach &/Or have Qualifications

Use of EJs to Keep in Touch with Topics in which the Academic Teaches &/or has Qualifications	Frequency	Percent
Always	13	6.3
Usually	22	10.6
Some of the time	72	34.8
Rarely	52	25.1
Never	47	22.7
No answer	1	0.5
Total	207	100

6.36 Use of EJs at Work

Questions 36 and 37 sought to discover if there was a difference in the location where ECU's academics accessed EJs, adding additional information to Question 24 (Section 6.24).

When respondents were asked if they read EJs while they were at ECU, again a statistically significant number, once the margin of error was considered, indicated they 'Rarely' or 'Never' accessed them from there (49.8 percent) at the time of the survey, as can be seen in Table 99 below. This result is not unexpected given previous results indicating that ECU's academics had generally not included EJs into their customary research and reading behaviour.

A note of frustration was indicated by one respondent who commented, "who has time for research at work?!!!"

Table 99 I Read Academic Electronic Journals When I Am At Work (at ECU)

Use of EJs at Work	Frequency	Percent
Always	14	6.8
Usually	27	13.0
Some of the time	63	30.4
Rarely	54	26.1
Never	49	23.7
Total	207	100

6.37 Use of EJs at Home

The results for Question 37 illustrates that there was a change of behaviour when respondents were asked if they read EJs at home.

Table 99, in Section 6.36 above, showed that 47.8 percent of respondents either 'Rarely' or 'Never' accessed EJs at work. However, this increased statistically significantly, once the margin of error was considered, to over 74 percent of respondents not reading EJs at home (Table 100 below). Indeed, a number of respondents commented that the reason they did not access EJs at home was due to their not having a modem, or even a computer there![118]

Comparing results from Tables 99 and 100, it became clear that while most ECU academics made little or no use of EJs at the time the survey was conducted, those

[118] This may have changed since the time of the study, as Internet technology take-up in Australian homes rapidly advances.

who did, were using them in their office more often than at home.

Section 6.24 highlighted that ECU academics generally did not consider using EJs more convenient than print journals. This is supported by the results from Questions 36 and 37 which highlights there were few academics being freed from their office and accessing EJs from home. As one respondent noted, "[I] prefer to read paper articles - they are more portable than my desktop machine".

Table 100 I Read Academic Electronic Journals at Home

Use of EJs at Home	Frequency	Percent
Always	4	1.9
Usually	12	5.8
Some of the time	36	17.4
Rarely	40	19.3
Never	114	55.1
No answer	1	0.5
Total	207	100

6.38 Printing Articles from EJs

Question 38 was included in the survey to supplement the findings in Section 6.11 – where respondents were asked to choose the corresponding behaviour that would most closely depict their intended behaviour in reading and /or printing EJs.

The results for Question 38 are presented in Table 101 below and indicated that a statistically significant number of ECU academics, once the margin of error was considered, preferred to make printouts of EJ articles that interested them (51.7 percent either 'Always' or 'Usually' made hard copies.) at the time of the survey. While Table 74

presented findings that indicated 6.3 percent of respondents either only read EJ articles on-screen or 'Other', and Table 101 below indicated that almost 16 percent of respondents 'Never' printed EJ articles, may appear to conflict, the difference is statistically acceptable, once the margin of error was considered.

It should also be noted that Question 11 was framed asking respondents about their *intention* to print EJ articles ("would you…"), whereas Question 38 was framed in the context of *current* behaviour (I make…).

Table 101 I Make Printouts of Articles I am Interested in

Printing Articles from EJs	Frequency	Percent
Always	42	20.3
Usually	65	31.4
Some of the time	52	25.1
Rarely	14	6.8
Never	33	15.9
No Answer	1	0.5
Total	207	100

6.39 Sending EJ Articles to Colleagues

Question 39 requested respondents to indicate if they would forward a copy of an article from an EJ to a colleague if they thought the colleague would find it interesting.

Table 102 below shows that the majority (70.5 percent) of respondents had either 'Always', 'Usually' or 'Some of the time' shared EJ articles with colleagues at the time of the survey. Though as one respondent who chose 'Rarely' commented, "if I used EJs that is".

On reflection, the Researcher notes that Question 39 did not specifically state the question was framed in regards to EJs and this may be a possible source of error for the results. However *all* respondent comments (15 in total) were in regards to EJs. Additionally, the instruction at the beginning of Section 4 (where Question 39 appeared, see Appendix B), stated:

> This section of the survey seeks to discover your usage patterns of electronic journals.

These three factors encourage the Researcher to assume that any error would likely be marginal. In addition, the results offer very clear evidence of behaviour.

Table 102 If I Found an Interesting Article I Would Send a Copy to a Colleague, Whom I Believed Would also Find it Interesting

Sending EJ Articles to Colleagues	Frequency	Percent
Always	10	4.8
Usually	53	25.6
Some of the time	83	40.1
Rarely	31	15.0
Never	28	13.5
No answer	2	1.0
Total	207	100

6.40 Notifying Colleagues of Interesting EJ Articles

Question 40 sought to discover if ECU academics preferred to *send* articles to their colleagues (Section 6.39) or *notify* colleagues of interesting articles.

Table 103 below presents the results for this question and demonstrates that while 81.6 percent of respondents would either 'Always' or 'Usually' or 'Some of the time' do this, there was no statistical significant difference with the results in Section 6.39, once the margin of error was considered.

As one respondent commented, 'I usually email [sic] the URL and other relevant details".

The results for Questions 39 and 40 are particularly interesting when compared to the results presented in Section 6.12 which highlighted that a majority of ECU academics had not cited EJs in their own work, yet appear to be willing to share EJ articles with colleagues.

Similarly with Question 39, after consideration, the Researcher noted that Question 40 did not specifically state the question was about EJs and this may be a possible source of error for the results. However *all* respondent comments (11 in total) were about EJs. Furthermore, the instruction at the beginning of Section 4 (where Question 40 appeared, see Appendix B), stated:

> This section of the survey seeks to discover your usage patterns of electronic journals.

These three factors encourage the Researcher to assume that any error would likely be marginal. In addition, the results offer very clear evidence of behaviour.

On further reflection however, if the Researcher were to conduct this research study again she would change these questions to ensure they were framed much more clearly, for example:

- Question 39 - If I found an interesting EJ article I would send/e-mail a full

copy of the article to a colleague, whom I believed would also find it interesting; and

- Question 40 - If I found an interesting EJ article I would send/e-mail a citation or URL for the article to a colleague, whom I believed would also find it interesting.

Table 103 If I Found an Interesting Article I would Notify a Colleague Whom I Believed Would also Find it Interesting

Notifying Colleagues of Interesting EJ Articles	Frequency	Percent
Always	17	8.2
Usually	74	35.7
Some of the Time	78	37.7
Rarely	19	9.2
Never	16	7.7
No Answer	3	1.4
Total	207	100[119]

6.41 Comments on Electronic Journals in General, or Their possible Use at ECU

The survey instrument presented another opportunity for respondents to express their personal opinions on EJs or their possible use at ECU.

There were many passionate comments noted and this Section includes a representative sample.

One respondent replied, "you've prompted me to find out more [about EJs]",

[119] The actual figure is 99.9 percent which becomes 100 percent when rounded for presentation in the table.

thereby perhaps influencing the future behaviour of that respondent. Another "an area in which I have little expertise at the moment, but it is on my list of important things to do to get better at in the near future", and yet another, "this has highlighted the need for me to do some more internet [sic] training". A number of other responses were received in a similar vein indicating how, simply by conducting the survey and placing the issue of EJs in ECU academics' minds; the survey may influence the sample's future behaviour towards EJs.

A number of respondents offered comments intended for ECU's librarians including:

- "[EJs are] essential at ECU as hard-copies usually [are] not available in our libraries";
- "If there are ways to search electronic journal databases then I'd like to know them. The library could run a feature electronic journal of the week/month to introduce us to it";
- "A training course for acad[emic] staff in how to make better use of electronic journals or to raise their awareness of electronic journals would be a good idea";
- "The lib[rary] database/on-line journal is good but not comprehensive. I have been unable to find the current edition of key journals online after the library cancelled the hard copy subscription on several occasions this year";
- "I think they are particularly useful for remote students and would like to see more links via the Library catalogue to electronic journal websites";
- "How [do I] find out about which are available in a specific field?"
- "Individual journals are not that useful. It is the f/t [full text] databases that provide real speed and convenience"; and
- [I] prefer [my journals] in one place - not on various floors as is done now.

A number of other respondents took the opportunity to again emphasise their lack of time:

- "Basically, the problem I have is not finding recent or relevant material (as my area is well served by traditional paper academic journals) but in finding the time to PROCESS the interesting articles/books that I have found";
- "I believe it is probably inevitable that we go this way but I am limited by time to practice"; and
- "I have found it impossible to keep up with all the demands made of me as [a] Lecturer A. Therefore [I] have been unable to devote any time to areas such as research and publishing articles. Therefore I have resigned from ECU in order to bring some normality to my life".

Concern about the 'digital divide' was noted by one respondent, who wrote, "too many places in the world do not have access to electronic media and ... people need info[rmation] that articles provide".

Local factors again were raised as reasons why some respondents were not using EJs, "until my PC is upgraded there is no chance of me using such things".

6.42 Conclusions

The results of this study clearly illustrate a divide between ECU's librarians and their clients. Section 3.2.1 reported that in 1998 ECU's librarians introduced a policy that 30 percent of its collections and access budget was to be devoted to electronic resources, including EJs (L. Leslie, personal communication, June 24, 2001). In June 2001, ECU had almost a third of its serial subscriptions available electronically (L. Leslie, personal communication, June 24, 2001). However, the results of the present study clearly show that at the time the survey was completed a majority of ECU

academics had:

- Not cited EJ articles in their work;
- Believed that publishing in print journals had more status than publishing in EJs;
- Did not find using EJs convenient;
- Were concerned with historical access for EJ articles;
- Were worried about eye strain from reading EJs; and
- Had not incorporated the usage of EJs into their normal research behaviour.

As such there was clearly some tension between ECU library policy and ECU academics' behaviour, at the time the study was conducted.

While only a small number of academics were citing EJs in their work, a much larger number thought their usage of them would increase in the future.

As one respondent to this study wrote, EJs "could no longer be done without" which contrasted with responses stating print journals must be retained.

On a serious note, one respondent wrote, "remember that the library is also a social experience. It gets me out of the office. I get to go for a walk etc." Another wrote:

> the screen does not lend itself to indepth [sic] study and reflective analysis. Good articles therefore need to be printed. However the electronic medium is an excellent distribution tool and the search mechanisms can be very powerful.

The *information gathering experience,* from the clients' perspective, and the

usability and acceptability of new technologies should be fully appreciated and understood by academic librarians, before forcing clients to change their established patterns of behaviour. The results of this study indicated that EJs were introduced into ECU without a complete understanding of their advantages and disadvantages, *from the clients' perspective* and *without properly equipping or training clients in the necessary skills.*

CHAPTER 7

CONCLUSIONS

The present study set out to provide insight and a clearer understanding of the role EJs play in the information seeking and usage habits of academics. The data obtained will contribute to academic librarians and other information professionals being able to make more informed decisions regarding the suitability and usefulness of EJs for academics.

The study demonstrates that all academics at one university do not equally use, nor have the same attitudes regarding the future role EJs will play in their research work. It illustrates the need for information professionals to continually observe and analyse the effects new technologies or media have on clients.

As Valauskas has asserted:

> there may indeed never be a point when electronic scholarly journals completely replace their paper counterparts. Each serves different functions for multiple audiences within a discipline (Valauskas, 1997).

The current study supports this claim, at least in the short to mid-term. One cannot discount the rapid advances in computer technology and perhaps one day the disadvantages associated with EJs will largely disappear or be negated and the next generation of academics will wholeheartedly embrace EJs as their preferred method of exchanging ideas.

While it is recognised that this study focused on academics from one university in Australia, the generalisability of the results is reinforced by Clayton's statement that

Australia's academics "appear to be typical of most universities around the world" (1999). Though it should be added that perhaps this claim may be more accurate if confined to 'western' universities. However, as noted in Section 1.4, it is the reader that will be in the best situation to judge the soundness of generalising this study's results to their own situation.

The following conclusions can be drawn based on the literature survey, the survey results and the comments from respondents which throw more light on the opinions behind the statistical data:

1. EJs were not wholly accepted by academics at the time of the survey;
2. There existed, at the time of the survey, a group of committed enthusiasts who would like to push EJs forward;
3. Conversely, there was almost an equal number of academics who passionately preferred paper-based journals, and were unlikely to change their preferences for the foreseeable future, perhaps for the rest of their career;
4. Most academics were generally not submitting articles to EJs at the time of the survey, though more are open to doing so in the future;
5. Academics continue to perceive that publishing EJ articles is held in lower esteem by their colleagues than publishing in print journals;
6. Academics are concerned about historical access to EJ articles;
7. While academics are not using EJs to their full potential, academics are generally aware of them;
8. Academics appear to have little spare time to devote to obtaining new skills such as using EJs, though there is an apparent willingness to do so;
9. Academics do not tend to hold their own personal subscriptions to EJs; and
10. While only a small number of academics were citing EJs in their work, a much larger number thought their usage of them would increase in the future.

Tomney and Burton's study (1998) concluded that authors such as Odlyzko (1994) or LaPorte et al. (c. 1995) who forecast the rapid demise of paper-based journals were likely to be proved incorrect. Tomney and Burton instead assumed that "print journals [will] continue for the foreseeable future" (1998, p. 428). The results from the present study support this hypothesis.

However, as academic librarians continue to cancel subscriptions to print journals and subscribe to EJs are they then forcing their clientele to take-up new technology before either their clients want it, have adapted their research methods to incorporate EJs, or are sufficiently skilled to utilise EJs expertly? Alternatively, are academic librarians alienating a portion of their clientele by investing in resources not all clients have the skills or are willing to use? As Marc Webb, a San Franciscan librarian was quoted as saying, "providing technology does not mean people can use the technology" (*Are we ready for the library of the future?,* 1997).

Milne (1999) noted when online catalogues were introduced into many libraries in the early 1980s it provided library clients with "their first confrontation with library technology, forcing them to change their traditional methods of seeking information" (Milne, 1999). One could question whether it is academic librarians' role to *force* their clients to change their information-seeking habits. This is a fundamental question that appears not to have been debated by the librarian community.

When librarians first considered introducing EJs, should they first have consulted their clients, giving the clients the opportunity to weigh the advantages and disadvantages of paper-based journals versus EJs? Then, only if introducing EJs was considered appropriate, should librarians have upskilled their clients to be able to utilise EJs expertly before the paper version is completely supplanted by an electronic version? As Milne (1999) also stated, library clients were often *not* consulted when new technologies were introduced in academic libraries, resulting in clients being *forced* to use new technologies when seeking information.

As Olsen (1994) has noted, journal literature is integral to academic scholarly work. It remains a concern that in 1998 ECU's librarians began to devote 30 percent of their collection and access budget to digital resources, including EJs (L. Leslie, personal communication, June 24, 2001) yet had not ascertained whether ECUs academic staff were willing to use them and had the appropriate skills to use them. Yet this study clearly demonstrates that by 1999/2000 ECU's academics had not incorporated using EJs into all their normal research techniques. For ECU to achieve the full value of its library budget this issue should be addressed to ascertain if this situation remains the same today.

This study did not set out to find out if EJs were good or bad for academics. One could speculate that EJs are inevitable. Indeed as one respondent to the study wrote, "electronic journals are going to happen", perhaps whether library users really want them to or not! As one respondent stated:

> My concern is that they are as 'reputable' as paper versions - the refereeing process must be maintained. There are a lot of advantages especially for students in being able to access information.

Perhaps the more important questions are:

- How best can libraries introduce them to their clients?
- Where EJs have already been introduced, what skills do clients need to learn to fully exploit them?
- What training methods should be used that are appropriate to academics' methods of learning, their workloads and the time they have to acquire new skills?
- What are the hindrances to clients using EJs?
- How can their disadvantages be negated?

- What, if anything, is being lost where academics do not have access to print journals?

As one respondent noted, “Electronic material is not convenient to read and think [sic]. One cannot snuggle up in bed with a computer as one can with print material”. Another stated, “I like the advertising in paper journals”.

Print journals have been in existence for over three centuries, however computers are enabling the information world to change more rapidly than information professionals have ever before seen. The Researcher proposes that it is possible that in one or two generations perhaps even EJs will be obsolete due to the not-yet-imagined changes in electronically delivered information. However, the Researcher believes that print journals will exist for some time to come alongside EJs and possible future formats. As one respondent stated, “there will be more and more of them [EJs]. However, some paper journals will persist in the future”.

As some respondents to this research study stated, "[EJs] are the way forward. [It is] inevitable that they will take over from paper-based resources" and "I strongly support the notion of e-journals, and find this medium invaluable for research and teaching". Conversely, other respondents wrote, "let's stick to the paper ones" and "there is nothing nicer than walking over to the library and reading a printed journal". In the short-term, library professionals will need to meet the needs of these two opposing preferences.

Whatever the future may be, academic librarians need to continually assess how their clients will be able to gain access to archival information. As one respondent to the current study commented, “I’m sure they [EJs] have a role given shrinking, or stagnant library budgets”. However, short-term access to electronic journal titles may seem to be a panacea for library budgets unable to keep up with increasing journal costs; however the consequences of cancelling paper journal titles in favour of EJs need to be considered if the library is unable to maintain the licensing costs to EJs.

7.1 Recommendations for future research

7.1.1 Further Research Opportunities Arising from this Study

Chapter 5 contains a number of suggestions for re-testing some of the questions investigated in the current study. Where inconclusive results were obtained re-testing on a larger sample may provide more conclusive results.

Section 5.1 noted that Faculties answered the survey uniformly and it was proposed that this could be due to individual schools being aggregated into larger faculties with the resulting 'blending' of results. It would therefore be useful to study usage of EJs according to individual schools or disciplines.

Related, follow-on studies could focus on the effects of changing from paper-based research to using electronic sources. Fatigue, stress and work performance could be assessed through physiological and psychological measures.

Other opportunities for further research that could follow on from this study include replicating the questionnaire at other tertiary institutions overseas and in 'non-western' universities to provide additional information for information professionals to assess.

It would also be interesting to learn if the perceptions of academic librarians at ECU regarding EJs match those of its faculty clientele. However, one could speculate that a librarian's professional education and information seeking expertise may influence their perceptions regarding EJs. Librarians may generally be more willing to use EJs and may view other issues such as permanence of EJs and historical access to EJ articles differently to their academic colleagues.

Replicating this study at five yearly intervals would enable a longitudinal study of changes and developments in this group's use of and attitudes towards EJs.

Survey methodology elicits the perceptions of respondents. Different methodologies could be used to provide additional information that may confirm or conflict with the findings achieved in the current study. Library transaction statistics, such as the number of times EJs are accessed, by how many unique clients[120], through ECU's online catalogue or how many individual journal articles are downloaded is technically possible and warranted. Comparing client perceptions against actual usage is valid and would give additional insight into how EJs are being taken up by ECU Library's client base. However, it should be noted that while measuring the actual usage of EJ articles is possible it is much more difficult to accurately measure the usage of print-based articles preventing the accurate comparison of the two.

7.1.2 Wider Possibilities for Research on this Theme

It is hoped that this study will act as a catalyst for other information professionals to conduct their own research to ask their own clients about:

- How the library's electronic resources are being used;
- If the resources are being provided in the most appropriate format and being delivered in the most appropriate way for the greatest majority of intended clients; and
- If clients are identified who are alienated either by the delivery mechanism or the format of the library's resources.

It is further hoped that in the light of results of any research on this issue, academic librarians will consider developing and implementing strategies to ensure all library clients are given equal opportunities to utilise the resources available to them.

[120] For example by using cookies this is possible. However, the privacy policy of ECU, or any other institution in which the research is being conducted would need to be considered before using cookies.

REFERENCES

The Internet has been a valuable tool for discovering articles referenced in this study. Many of the papers referenced in this thesis are available on the Internet. The references to these papers include their URLs. These URLs were current at the time they were obtained. Given the rapidly changing nature of the Internet the Researcher acknowledges that there is no guarantee that these papers will continue to be available at these locations which is a problem identified in this thesis.

Amiran, E., Orr, E. & Unsworth, J. (1991). Refereed electronic journals and the future of scholarly publishing. *Advances in Library Automation and Networking.* [Online]. Available: http://jefferson.village.virginia.edu/~jmu2m/advances.html [2000, November 1].

Anand, A. K. & Malhan, I. V. (1982). Some investigations on resource sharing on chemistry journals for the university libraries of Punjab, Haryana, Himachal Pradesh and Chandigarh. *Annals of Library Science and Documentation.* 29 (2), pp. 76-89.

Applebee, A.C., Clayton, P. & Pascoe, C. (1997). Australian academic use of the Internet. *Internet Research: Electronic Networking Applications and Policy,* 7 (2) [Online]. Available: http://www.emerald-library.com/brev/17207bal.htm [2000, April 14].

Are we ready for the library of the future? (1997). *The Culture of Technology, the Technology of Culture.* [Online]. Available: http://www.salon1999.com/21st/feature/1997/12/02feature.html [1997, April 12].

Ashcroft, L. & Langdon, C. (1998). Electronic journals in higher education libraries. *New Library World.* 99 (6). [Online]. Available: http://www.emerald.library.com/brev/07299fd1.htm [2000, April 14].

Association for Research Libraries. (1998). *ARL Directory of electronic journals, newsletters and academic discussion lists.* [Online]. Available: http://www.arl.org/scomm/edir/1997/pr97.html [2002, February 11].

Association for Research Libraries. (2000). *New for scholars and information professionals: The directory of scholarly electronic journals and academic discussion lists, first edition.* [Online]. Available: http://dsej.arl.org/dsej/2000/dsej1pr.html [2002, February 11].

Australian Library and Information Association. (2001). *Australian library journal: Notes to contributors.* [Online]. Available: http://www.alia.org.au/alj/contributor.notes.html [2002, August 15].

Australian Universities Quality Agency. (2004). *Report of an audit of Edith Cowan University.* [Online]. Available: http://www.ecu.edu.au/Quality@ECU/docs/October%2020_Definite%20Finf_REPORT.pdf [2004, December 29].

Bane, A. F. & Milheim, W. D. (1995). Internet insights: How academics are using the Internet. *Computers in Libraries* 15 (2), pp. 32-36.

Berge, Z. L. & Collins, M. P. (1996). IPCT Journal: Readership survey. *Journal of the American Society for Information Science.* 47 (9), pp. 701-710.

Bergstein, B. (1991). Hacker tainted content on Yahoo! newspages. *The Nando Times.* [Online]. Available: http://qqq.nandotimes.com/technology/story/105256-1201124c.html [2001, September 25].

Bailey, C.W. (1992). Network-based electronic serials. *Information Technology and Libraries*, 11 (1), pp. 29-38.

Björk, B-C. (2004). Open access to scientific publications – an analysis of the barriers to change? *Information Research.* 9 (2). [Online]. Available: http://InformationR.net/ir/9-2/paper170.html [2004, December 3]

Bonthron, K., Urquhart, C., Thomas, R., Armstrong, C., Ellis, D., Everitt, J., Fenton, R., Lonsdale, R., McDermott, E., Morris, H., Phillips, R., Spink, S. & Yeoman, A. (2003). Trends in use of electronic journals in higher education in the UK – views of academic staff and students. *D-Lib Magazine* 9 (6). [Online]. Available: http://www.dlib.org/dlib/june03/urquhart/06urquhart.html [2003, September 12].

Chan, L.K.W. (1996). Exciting potential of scholarly electronic journals. Originally published in *CAUT Bulletin*, 43 (7), pp. 9-?. [Online]. Available: http://www.caut.ca/English/Bulletin/96_sep/ejournal.htm [2002, September 19].

Clayton, P. (1999). Academics online: The reality. *Skills for Effective Scholarship and Research in the Digital Environment.* National Scholarly Communications Forum - Round Table No. 9 [Online]. Available: http://www.asap.unimelb.edu.au/nscf/roundtables/roundtable_9_clayton.htm [2002, July 4].

Collins, M. P. & Berge, Z. L. (1994). IPCT Journal: A case study of an electronic journal on the Internet. *Journal of the American Society for Information Science,* 45 (10), pp. 771-776.

Coolican, H. (1990). *Research methods and statistics in psychology.* London: Hodder and Stoughton.

Cronin, B. & Overfelt, K. (1995). E-journals and tenure. *Journal of the American Society for Information Science*, 46 (9), pp. 700-703.

Denzin, N.K. & Lincoln, Y. S. (Eds.). (1994). *Handbook of qualitative research.* Thousand Oaks, CA.: Sage Publications.

Dickstein, R. & Mills, V. (2000). Usability testing at the University of Arizona library: How to let the users in on the design. *Information Technology and Libraries*, 19 (3). [Online]. Available: http://www.lita.org/ital/1903_mills.html [2002, July 18].

Directory of electronic journals, newsletters and academic discussion lists. 1991-. Washington, DC: Association of Research Libraries, Office of Scientific and Academic Publishing.

Dixon, A. (1998). A 12-step program for electronic scholarly publishing. *Searcher,* 6 (1), pp. 25-30.

Dodson, J. T. & Miller, L. (1980). Soaring journal costs: A cooperative solution. *Library Journal.* 105 (16), pp. 1793-1795.

EBSCO announces easier access to full text. (1999). *Information Today*, 16 (95), p. 68.

Edith Cowan University. (1998). *Edith Cowan University: Summary statistics.* [Online]. Available: http://www.cowan.edu.au/ecuwis/docs/intro/ecustats.html [2001, August 21].

Edith Cowan University. (c. 2001a). *Pocket statistics - ECU statistics at a glance.* [Online]. Available: http://www.ecu.edu.au:80/IRS/html/index.html#pocket [2002, May 4].

Edith Cowan University. (c. 2001b). *2000 Edith Cowan University StatsBook-on-the-Web.* [Online]. Available: http://www.cowan.edu.au/IRS/sb00/sb00.html [2002, July 2].

Edith Cowan University. (2003a). *2002 Annual Report: Statistics.* [Online]. Available: http://www.ecu.edu.au/pr/annual/stats/statistics.html [2003, July 2].

Edith Cowan University. (2003b). *About Research Contact.* [Online]. Available: http://www.ecu.edu.au/GraduateSchool/publications/Researchcontact.html [2003, July 2].

Edith Cowan University. (2003c). *ECU Library Online: Introducing your Library Service.* [Online]. Available: http://www.ecu.edu.au/library/liberty/lib001b.html [2003, July 2].

Edith Cowan University. (2003d). *ECU Library Online: Liberty... learning to find information.* [Online]. Available: http://www.cowan.edu.au/library/liberty/index.htm [2003, July 2].

Edith Cowan University. (2003e). *ECU Library Online: Library opening hours.* [Online]. Available: http://www.cowan.edu.au/library/services/hours.html [2003, July 2].

Edwards, J. (1997). Electronic journals: Problem or panacea? *Ariadne,* 10. [Online]. Available: http://www.ariadne.ac.uk/issue10/journals/ [1998, June 4].

Electronic access provided to John Wiley journals. (1997). *Managing Information*, 4 (9) [Online]. Available: http://sun1.aslib.co.uk/man-inf/nov97/news6.html [1999, May 14].

Elsevier Science and OCLC to make journals available electronically. (1995). [Online]. Available: http://www.oclc.org/oclc/prss/950223.htm [1998, October 23].

Fisher, J.H. (1997). Comparing electronic journals to print journals: Are there savings? *Scholarly Communication and Technology*, Conference at Emory University April 24-25, 1997. [Online]. Available: http://arl.cni.org/scomm/scat/fisher.html [1999, April 15].

Fosmire, M. & Yu, S. (2000). Free scholarly electronic journals: How good are they? *Issues in Science and Technology Librarianship.* [Online]. Available: http://www.library.ucsb.edu/istl/00-summer/refereed.html [2000, October 23].

Franklin, B. & Plum, T. (2004). Library usage patterns in the electronic information environment. *Information Research*, 9 (4) paper 187.[Online]. Available: http://informationr.net/ir/9-4/paper187.html [2004, December 3].

Frazier, K. (1988). Liberating scholarship. *Library Journal.* 123 (17), pp. 40-41.

Gable, G.G. (1994). Integrating case study and survey research methods: An example in information systems. *European Journal of Information Systems,* 3 (2), pp. 112-126.

Galliers, R.D. (1992). Choosing information systems research approaches in R. Galliers (Ed.), *Information systems research: Issues, methods, and practical guidelines.* pp. 144-162. Oxford: Blackwell Scientific Publications.

Garrod, P. (2004). 2003, 2004: A backward glance and thoughts on the future. *Ariadne,* 38. [Online]. Available: http://www.ariadne.ac.uk/issue38/public-libraries/intro.html [2004, December 29].

Ginsparg, P. (1996). Winners and losers in the global research village. *Electronic Publishing in Science, Scientist's View of Electronic Publishing and Issues Raised,* UNESCO Conference, Paris, 19-23 February 1996. [Online]. Available: http://xxx.lanl.gov/blurb/pg96unesco.html [2000, July 5].

Harnad, S. (1992). *Interactive publication: Extending the American Physical Society's discipline-specific model for electronic publishing.* [Online]. Available: http://www.cogsci.soton.ac.uk/~harnad/Papers/Harnad/harnad92.interactivpub.html [1998, June 4].

Harnad, S. (1995a). *Electronic scholarly publication: Quo Vadis* [Online]. Available: http://www.cogsci.soton.ac.uk/~harnad/Papers/Harnad/harnad95.quo.vadis.html [1998, June 4].

Harnad, S. (1995b). *Universal FTP archives for esoteric science and scholarship: A subversive proposal.* [Online]. Available: http://cogsi.soton.ac.uk/~harnard/subvert.html [1998, June 4].

Harrison, T. M. & Stephen, T. D. (1995). The electronic journal as the heart of an online scholarly community. *Library Trends,* 43 (4), pp. 592-608.

Harrison, N. & MacLeod, R. (2003). Free full-text e-journals and EEVL's engineering e-journal search engine. *Ariadne,* 35. [Online]. Available: http://www.ariadne.ac.uk/issue35/eevl/intro.html [2003, September 12].

Harter, S. P. (1996). The impact of electronic journals on scholarly communication: A citation analysis. *The Public-Access Computer Systems Review.* 7 (5). [Online]. Available: http://info.lib.uh.edu/pr/v7/n5/hartn5.html [2000, November 1].

Harter, S. P. (1998). Scholarly communication and electronic journals: An impact study. *Journal of the American Society for Information Science,* 49 (6), pp. 507-516.

Harter, S. P. & Kim, H .J. (1996). *Electronic journals and scholarly communication: A citation and reference study* [Online]. Available: http://ezinfo.ucs.indiana.edu/~harter/harter-asis96midyear.html [2000, November 1].

Hitchcock, S. (1996). Open journals. *Ariadne,* 5. [Online]. Available: http://www.ariadne.ac.uk/issue5/open [1998, October 23].

Hitchcock, S; Carr, L. & Hall, W. (1996). A survey of STM online journals 1990-95:

The calm before the storm. [Online]. Available: http://journals.ecs.soton.ac.uk/survey.html [1998, February 2].

Hitchcock, S.; Carr, L.; Hall, W.; Harris, W.; Probets, S; Evans, D. & Brailsford. (1998). Linking electronic journals: Lessons from the Open Journal project. *D-Lib Magazine*. [Online]. Available: http://www.dlib.org/dlib/december98/12hitchcock.html [2000, April 12].

Hooper, A. S. C. (1997/88). Budget cuts in university libraries and their impact on library cooperation and academic publishing. *Jagger Journal*, 3, pp. 10-12.

Hughes, J. A. & Lee, C. A. (1998). Giving patrons what they want: The promise, process and pitfalls of providing full-text access to journals. *MCB Collection Building*. 17 (4). [Online]. Available: http://www.emerald-library.com/brev/17117da1.htm [2000, April 14].

Hunter, K. (1998). Electronic journal publishing: Observations from inside. *D-Lib Magazine*. [Online]. Available: http://www.dlib.org/dlib/july98/07hunter.html [2000, April 12].

Hyldegaard, J. and Seiden, P. (2004). My e-journal: Exploring the usefulness of personalized access to scholarly articles and services. *Information Research*, 9 (3) paper 181. [Online]. Available: http://information.net/ir/9-3/paper181.html [2004, December 3].

I also froth. (2004). [Online]. Available: http://www.swarthmore.edu/SocSci/tburke1/perma12104.html [2004, March 22].

Kerlinger, F. N. (1973). *Foundations of behavioral research* (2nd. Ed.). New York: Holt, Rinehart and Winston.

Kiesler, S. & Sproull, L.S. (1986). Response rates in the electronic survey. *Public Opinion Quarterly*, 43, pp. 402-413.

Lancaster, F. W. (1995). Attitudes in academia towards feasibility and desirability of networked scholarly publishing. *Library Trends,* 43 (4), pp. 741-752.

Langston, L. (1996*). Untangling the web. Scholarly communication and electronic publication: Implications for research, advancement, and promotion.* [Online]. Available: http://www.library.ucsb.edu/untangle/langston.html [1998, October 3].

LaPorte, R. E., Marler, E., Akazawa, S., Sauer, F., Gamboa, C., Shenton, C., Glosser, C., Villasenor, A., & Maclure, M. (c. 1995). *The death of biomedical journals* [Online]. Available: http://www.tecc.co.uk/bmj/archive/6991ed2.htm [1998, July 5].

Leslie, J. (1994). Goodbye Gutenberg: Pixelating peer review is revolutionizing scholarly journals. *Wired*. 2 (10). [Online]. Available: http://ccat.sas.upenn.edu/jod/texts/wired.html [2002, September 19].

Libraries take a stand. (2004). *Harvard University Gazette*, [Online]. Available: http://www.news.harvard.edu/gazette/2004/02.05/10-libraries.html [2004, March 22].

Logue, S. (2003). Guest editorial: The changing role of libraries in instructional support. *Information Technology and Libraries*, 22 (2). [Online]. Available: http://www.lita.org/Content/NavigationMenu/LITA/LITA_Publications4/ITAL_Information_Technology_and_Libraries/2202_editorial.htm [2003, September 12].

Luther, J. (1998). Full-text journal subscriptions: An evolutionary process. *DEJ Online* [Online]. Available: http://www.arl.org:591/luthor.html [1998, February 19].

McEldowney, P.F. (1996). *Scholarly electronic journals- trends and academic attitudes: A research proposal.* [Online]. Available: http://poe.acc.virginia.edu/~pm9k/libsci/ejs.html/ [1998, February 19].

McKay, S.C. (1999). Accessing electronic journals. *Econtent*. 22 (2). [Online]. Available: http://global.umi.com/pqdweb?TS=9...Sid=2&Idx=23&Deli=1&RQT=309&Dpt=1 [2000, June 9].

McKnight, C. (1993). Electronic journals - past present ... and future? *Aslib Proceedings,* 45 (1), pp. 7-10.

Majid, S. & Abazova, A. F. (1999). Computer literacy and use of electronic information sources by academics. A case study of International Islamic University Malaysia. *Asian Libraries,* 8 (4). [Online]. Available: http://www.emerald-library.com/brev/17308dal.htm [2000, April 14].

Manmart, L. (2001). *Impact of Internet on schools of library and information science in Thailand.* Proceedings of the 67th IFLA Council and General Council, August 16-25, 2001. [Online]. Available: http://www.ifla.org/IV/ifla67/papers/140-193e.pdf [2002, July 4].

Marsland, N., Wilson, I. M., Abeyasekera, S. and Kleih, U. (2000). *A methodological framework for combining quantitative and qualitative survey methodologies.* [Online]. Available: http://www.rdg.ac.uk/ssc/dfid/booklets/qqa.html [2002, November 7].

Meadows, J. (1997). Can we really see where electronic journals are going? *Library Management*. 18 (3). [Online]. Available: http://www.emerald-library.com/brev/01518cf1.htm [2000, April 14].

Merton, P. (c. 1995). *Methodology.* [Online]. Available: http://aggie-horticulture.tamu.edu/earthkind/merton/meth.html [2002, July 16].

Milne, P. (1999). Electronic access to information and its impact on scholarly communication. [Online]. http://www.csu.edu.au/special/online99/proceedings99/305b.htm Available: [1999, September 17].

Mitchell, M. & Jolley, J. (1988). *Research design explained.* New York: Holt, Rinehart and Winston.

Mogge, D. (1998) *ARL directory tracks growth in e-publishing.* [Online]. Available: http://www.arl.org/newsltr/196/dej.html [2003, September 12].

Monty, V. (1996). Electronic journals: Publishing paradigm. *Information Technology.* [Online]. Available: http://infoweb.magi.com/~mmelick/it96feb.htm [2002, September 26].

Morris, S. (1995). The future of journal publishing. *Interlending and Document Supply*, 23 (4). [Online]. Available: http://www.emerald-library.com/brev/12223dc1.htm [2000, April 14].

Naylor, B. (1996). Opinion paper: Paying for scholarly communication: The future as a guide to the past. *Interlending and Document Supply*, 24 (2). [Online]. Available: http://www.emerald-library.com/brev/12224be1.htm [2000, April 14].

Newsted, P.R.; Huff, S.L. & Munro, M.C. (1998). Survey instruments in information systems. *MIS Quarterly*, 22 (4), pp. 553-554.

Niles, R. (c. 1996a) *Margin of Error.* [Online]. Available: http://www.robertniles.com/stats/margin.shtml [1999, January 12].

Niles, R. (c.1996b) *Polls and Sample Sizes.* [Online]. Available: http://www.robertniles.com/stats/sample.shtml [1999, January 12].

Odlyzko, A. M. (1994). *Tragic loss or good riddance? The impending demise of traditional scholarly journals.* [Online]. Available: http://www.research.att.com/~amo/doc/tragic.loss.txt [2000, January 11].

Okerson, A. (1992). *University libraries and scholarly communication.* [Online]. Available: http://www.lib.virginia.edu/mellon/synopsis.html [1998, July 5].

Olsen, J. (1992). *Electronic journal literature: Implications for scholars.* Westport, CT: Mecklermedia Corporation.

Open Journal Project: Bringing journals alive on the World Wide Web. (1998). [Online]. Available: http://journals.ecs.soton.ac.uk/ [1998, July 5].

Open Journal Project: Final report to eLib. (1998). [Online]. Available: http://journals.ecs.soton.ac.uk/yr3/3rd-year-open.htm [2002, September 17].

Peek, R. (2001). The tangled scholarly publishing mess. *Information Today,* 18 (4), pp. 36-38.

PMC: Postmodern Culture. [Online]. Available: www.iath.virginia.edu/pmc/contents.all.html [2002, July 18].

Pullinger, D. (1999). Academics and the new information environment: The impact of local factors on use of electronic journals. *Journal of Information Science.* 25 (2), pp, 164-172.

Rapple, B. A. (1995). Electronic journals: Benefits and difficulties. *Catholic Library World,* 66 (2), pp. 30-34.

Rivas-Rodriguez, M. (1997). Electronic academic journals and information quality. *Information Quality.* [Online]. Available: http://www.unc.edu/~mrivas/newsqual/journal.htm [1999, October 23].

Rojo, A. (1995). *Participation in scholarly electronic forums. A University of Toronto PhD thesis.* [Online]. Available: http://www.digitaltempo.com/e-forums/chap3.html [1999, August 15].

Rowland F. (c. 1996). Print journals: Fit for the future? *Ariadne,* Issue 7. [Online]. Available: http://www.ariadne.ac.uk/issue7/fytton/ [1998, June 4].

Rowley, J. (2000). The question of electronic journals. *Library Hi Tech,* 18 (1). [Online]. Available: http://www.emerald-library.com/brev/23818ae1.htm [2000, April 14].

Rowley, J. (2001). JISC user behaviour monitoring and evaluation framework. *Adriane,* Issue 30. [Online]. Available: http://www.adriane.ac.uk/issue30/jisc/ [2002, January 29].

Rupp-Serrano, K. (1995). *From Gutenberg to gigabytes: E-Journals and the scholarly community.* ERIC Documents no.: ED386720.

Rusch-Feja, D. & Siebeky, U. (1999). Evaluation of usage and acceptance of electronic journals: results of an electronic survey of Max Planck Society researchers including usage statistics from Elsevier, Springer and Academic Press (Full Report). *D-Lib Magazine.* 5 (10). [Online]. Available: http://www.dlib.org/dlib/october99/rusch-feja/10rusch-feja-full-report.html [2000, April 12].

Rutstein, J.S., DeMiller, A.L. & Fuseler, E.A. (1993). Ownership versus access: Shifting perspectives for libraries. *Advances in Librarianship,* 17, pp. 33-59.

Schauder, D. (1994). Electronic publishing of professional articles: Attitudes of academics and implications for the scholarly communication industry. *Journal of the American Society for Information Science,* 45 (2), pp. 73-100.

Silver Platter. (c.2003). PDQ – The medical and pharmaceutical collection. [Online]. Available: http://www.rose-net.co.ir/products/PRODUCTS1/SP/pdq.htm [2003, July 4]

Speier, C., Palmer, J., Wren, D. & Hahn, S. (1999). Faculty perceptions of electronic journals as scholarly communication: A question of prestige and legitimacy. *Journal of the American Society for Information Science,* 50 (6), pp. 537-543.

Stevenson, L. (2001). Electronic journals set-back. *Edinburgh BITs.* [Online]. Available: http://www.ucs.ed.ac.uk/bits/2001/february_2001/ [2003, February 13].

Stewart, L. (1996). User acceptance of electronic journals: Interviews with chemists at Cornell University. *College and Research Libraries*, 57 (4), pp. 339-349.

Sullivan, S. (1997). Electronic journals in the University of Melbourne. *Ex Libris: Newsletter of the University Melbourne Library,* 47, pp. 12-13.

Survey methodology. (1998). *Logistics Management and Distribution Report,* 37 (9), pp. 64-65. [Online]. Available: http://www.manufacturing.net/lm/article/CA145453 [2001, June 28].

Tenner, E., Gyeszly, S.D. & Rholes, J.M. (1998). Electronic and traditional sources for a newly established branch library: Product availability and user preferences. *Collection Building,* 17 (3). [Online]. Available: http://www.emerald-library.com/brev/17117cc1.htm [2002, April 14].

Tilbrook, R. (1999a). How can we help staff to learn about the new email package? In K. Martin, N. Stanley and N. Davison (Eds), *Teaching in the Disciplines/Learning in Context, 443-446.* Proceedings of the 8th Annual Teaching Learning Forum, The University of Western Australia, February 1999. Perth: UWA. [Online]. Available: http://cea.curtin.edu.au/tlf/tlf1999/tilbrook.html [2002, July 4].

Tilbrook, R. (1999b). Providing university-wide training in a new email package: Some lessons learnt. Proceedings of the HERDSA Annual International Conference, Melbourne, July 1999. [Online]. Available: http://www.herdsa.org.au/vic/cornerstones/pdf/Tilbrook.PDF [2002, July 4].

Tilburg University. (c.1998). *Use of printed versus electronic journals.* [Online]. Available: http://www.tilburguniversity.nl/services/library/projects/closed/journal.html [2004, March 22].

Tomney, H. & Burton, P.F. (1998). Electronic journals: A study of usage and attitudes among academics. *Journal of Information Science,* 24 (6), pp. 419-429.

Treloar, A. (1995). Electronic scholarly publishing and the World Wide Web. *Proceedings of AusWeb 95: The First Australian World Wide Web Conference.* [Online]. Available: http://www.scu.edu.au/sponsored/ausweb/ausweb95/papers/publishing/treloar [1998, March 6].

TULIP: The University Licensing Project. (1996). [Online]. Available: http://scholar.lib.utk.edu/casado/TULIP.htm [1998, October 23].

TULIP: Final report summary. (1996). [Online]. Available: http://scholar.lib.utk.edu/casado/finalreport.htm [1998, October 23].

Universities in Australia. (c.2004). [Online]. Available: http://www.australian-universities.com [2004, December 29].

University of Sydney Library. (2003). *Policy on networked electronic access – preference over print.* [Online]. Available: http://www.library.usyd.edu.au/about/policies/networked.html [2003, March 7].

University of Texas at Austin. (2003). *University of Texas at Austin. General Libraries. Statistical overview of the library collections.* [Online]. Available: http://www.lib.utexas.edu/admin/cird/collectionoverview.html [2003, March 7].

Valauskas, E. J. (1997). First Monday and the evolution of electronic journals. *Journal of Electronic Publishing,* 3 (1). [Online]. Available: http://www.press.umich.edu/jep/03-01/FirstMonday.html [2000, October 12].

Varian, H. R. (1997). The future of electronic journals. *Scholarly Communication and Technology.* Conference at Emory University, April 24-25, 1997. Session 2, The Evolution of Journals. [Online]. Available: http://www.arl.org/scomm/scat/varian.html [2000, July 5].

Waddell, P. (1993). The potential for electronic journals in UK academia. In *Libraries and IT: Working papers of the Information Technology Sub-Committee of the HEFC's Libraries Review*: 239-271. Bath, UK: The Office for Library and Information Networking.

Whalley, B. (1996). Electronic journals, evolutionary niches. *Ariadne,* Issue 3. [Online]. Available: http://www.ariadne.ac.uk/issue3/ggg/ [2003, February 13].

Widdicombe, R. P. (1993). Eliminating all journal subscriptions has freed our customers to seek the information they really want and need: The result – more access, not less. *Science and Technology Libraries,* 14 (1), pp. 3-13.

Woodward, H., Rowland, F., McKnight, C., Meadows, J. & Pritchett, C. (1997). Electronic Journals: Myths and realities. *Library Management,* 18 (3). [Online]. Available: http://www.emerald-library.com/brev/01518cg1.htm [2000, April 14].

APPENDIX A
PILOT SURVEY –LETTER AND SURVEY QUESTIONS

Dear Member of Maritime,

I am conducting a survey of most members of Maritime and inviting you to take part.

The attached survey will provide a better understanding of the role Electronic Journals are currently playing in your research & literature usage. This survey intends to provide some hard data to enable the Co-ord & Management Team to make more informed decisions regarding electronic journals. The questionnaire also serves the purpose of pre-testing the survey instrument for my Masters degree.

Your participation in this survey is important as while the usage of electronic journals has seen many opinions and theories being stated, there has been little research conducted.

I guarantee that your response will be completely confidential. While signing the "Agreement to Take Part" will provide me with your name this will only be kept for verification of informed consent and will be stored in a secure area. It will also be used so you do not receive a follow-up questionnaire. **NO** information will be used if an individual person may be identified, and no person, other than myself, will view your individual response.

PLEASE complete the survey as soon as possible and return it to my desk. The value of the information gathered depends on the co-operation of yourself and your co-workers.

Any questions concerning the project titled "*Factors influencing the usage of Electronic Journals*" can be directed to **Margaret Krikorian** (Principal Investigator) on ext. XXXX or home (0X) XXXX-XXXX[121].

Thank you in advance for your co-operation with this survey.

Margaret Krikorian.

[121] Deleted for privacy.

Agreement to take part (PLEASE COMPLETE)

I have read the information overleaf & any questions I have asked have been answered to my satisfaction. I agree to participate in this activity. I agree that the research data gathered in this study may be published provided that I am not identifiable.
Participant: (please write your name here)_____
Signature:

_____
Date:_____

SECTION 1

PLEASE PLACE AN "X" NEXT TO THE APPROPRIATE CATEGORY.

1 Gender
____ Male
____ Female

2 Age (this calendar year)
____ 20-30
____ 31-40
____ 41-50
____ 51-60
____ 61 and over

3 Amount of time since your last tertiary qualification was conferred
____ Less than 1 year
____ More than 1 year less than 5 Years
____ More than 5 years less than 10 yrs
____ More than 10 years
____ Not applicable

4 Please indicate approximately how many hours per week you spend on work related research activities during an average week:

_____

5 Please indicate approximately how many hours per week you spend on writing reports/QTB's/QON's[122] etc & related activities during an average week:

_____

SECTION 2

PLEASE PLACE AN "X" NEXT TO THE APPROPRIATE CATEGORY.

Definition: 'electronic journals' are similar in nature to 'paper-based' journals and may contain features paper journals are not able to (such as hyper-text links, video, etc), but are **exclusively** delivered to you through an electronic medium, such as the Internet. Electronic versions of *The Canberra Times* or *New Scientist* etc are examples, but I am interested in your usage of the **electronic versions ONLY. I am also ONLY interested in your attitudes and usage patterns for work related functions.**

Please take as much room as you need for your answers (feel free to write on the back, or attach additional sheets).

6 Are you aware of electronic journals?
____ Yes (please continue with the survey)
____ No (please finish here and return this survey)

7 In the years 1994-1998 have you submitted articles to paper-based, journals?
____ Yes (Approx. how many) ____
____ No
Why/Why Not _____

[122] QTB – Question Time Brief; QON – Question on Notice

8 In the years 1994-1998 have you submitted articles to electronic journals?

____ Yes (Approx. how many?)_____

____ No

Why/Why Not_____

_____

9 At present, do you intend to submit your own work for publication in electronic journals in the future?

____ Yes

____ No

____ Depends (Please specify)_____

_____

10 Have you cited or used articles from electronic journals in your own work?

____ Yes

____ No

Why/Why not _____

_____

11 Would you cite articles from electronic journals in the future?

____ Yes

____ No

____ Depends (please specify)_____

_____

12 Are you aware of any of your own articles being cited in an article in an electronic journal?

____ Yes

____ No

Comments? _____

_____

13 Do you personally read any electronic journals?

____ Yes (How many/ & how often)

_____/_____

____ No

Why/Why Not _____

_____

14 Would you

____ ONLY read articles on-screen from electronic journals?

____ ONLY print out interesting articles and then read them?

____ Read articles both on screen AND make copies to read later or to keep.

____ Other (please specify)_____

_____

Any Comments? _____

_____

14 How would you classify your experience using electronic networks, such as the Internet?

____ Beginner

____ Intermediate

____ Intermediate to advanced

____ Advanced

____ Other) Please specify) _____

_____

Any Comments? _____

SECTION 3

This section of the survey seeks your **attitudes towards** electronic journals.

From the scale below, please select the number which most nearly reflects your ATTITUDE to the following statements.

Strongly Agree		**Neutral/ No opinion**		**Strongly Disagree**
1	**2**	**3**	**4**	**5**

Please write your choice in the space at the beginning of the statement.

___I obtain information I need quickly using electronic journals

Strongly Agree		Neutral/ No opinion		Strongly Disagree
1	2	3	4	5

___I find accessing information in electronic journals difficult
___I am willing to publish my own writing in electronic journals
___I am familiar with accessing information via the Internet
___ I believe there is less status publishing in electronic journals than in paper journals
___The publication of articles in electronic journals is much faster than paper-based journals (the time it takes from submission to the publication)
___I prefer electronic journals because there is no wastage of paper.
___I find using electronic journals is more convenient than paper-based journals
___I believe most electronic journals have poor or inconsistent quality of articles
___Electronic journal articles must be refereed for me to take them seriously
___I believe publishing in electronic journals lacks professional status
___I am concerned about archival and historical access electronic journal articles
___Publishing in an electronic journal does not contribute to promotion
___I cannot be completely sure that any article appearing in an electronic journal has not been altered since being posted
___I prefer using electronic journals over their print counterparts

SECTION 4

This section of the survey seeks your **usage of** work-elated electronic journals.

From the scale below, please select the number which most nearly reflects your USAGE of electronic journals.

Never		Some of the time		Always
1	2	3	4	5

Please write your choice in the space at the beginning of the statement.

___I read electronic journals for work

___I search electronic journals when researching a new topic for work

___I read electronic journals to keep in touch with topics associated with areas in which I work

___I read electronic journals for work when I am **at work**

___I read electronic journals for work at home

___I make printouts of articles I am interested in

___If I found an interesting article I would send a copy to a colleague, whom I believed would also find it interesting

___If I found an interesting article I would notify a colleague whom I believed would also find it interesting

Please put this completed survey in the box at Margaret Krikorian's desk.

Thank you

APPENDIX B

FINAL SURVEY – LETTER AND SURVEY QUESTIONS

STOP

5 -10 MINUTES OF YOUR TIME IS NEEDED

Dear Academic,

I am conducting a survey of ECU academics as a part of my M.Sc. (Information Science) degree at Edith Cowan University.

You have been included in a random sample of academics at ECU that have been chosen to provide concrete information on the attitude of academic staff towards electronic journals.

This research will provide important information that may impact on academic libraries decisions whether or not to include electronic journals in their collections. There are many important questions that need to be researched and answered about electronic journals before libraries commit themselves irrevocably to changing collection policies.

Your participation in this survey is important. While this area has seen many opinions and theories being stated, there has been little research conducted.

This is an anonymous questionnaire. Please ensure that you do not write your name, or any other comments that will make you identifiable, on the attached survey. By completing the questionnaire you are consenting to take part in this research. **I guarantee that your response will be confidential.** While questionnaires are coded this is only to ensure you do not receive a follow-up reminder letter. **NO** information will be used in any way so that any individual person could be identified.

PLEASE use the enclosed envelope and complete the survey as soon as possible.

Any questions concerning the project entitled "Factors influencing academics' usage of electronic journals" can be directed to **Margaret Krikorian** (Principal Investigator) on (0X) XXXX- XXXX[123]; or my supervisor **Karen Anderson** (School of Computer & Information Science) on (08) 9370-XXXX[121]

Thank you in advance for your co-operation with this survey.
Margaret Krikorian.
e-mail XXXX[121]

[123] Deleted for privacy.

SECTION 1

PLEASE TICK THE APPROPRIATE CATEGORY.

1 Gender

☐ Male

☐ Female

2 Age (this calendar year)

☐ 20-30

☐ 31-40

☐ 41-50

☐ 51-60

☐ 61 and over

3 Amount of time since your last qualification was conferred

☐ Less than 1 year

☐ More than 1 year less than 5 Years

☐ More than 5 years less than 10 years

☐ More than 10 years

☐ Currently studying towards _____ qualification

4 Please indicate whether your job title is:

☐ Lecturer

☐ Senior Lecturer

☐ Researcher

☐ Head of School

☐ Other (Please specify)

_____

5 Please indicate which Faculty you are with

☐ Faculty of Communications, Health and Science

☐ Faculty of Community Services, Education and Social Sciences

☐ Faculty of Business and Public Management

☐ WA Academy of Performing Arts

Please state your school or division

_____

6 Please indicate approximately how many hours per week you spend on research activities during the semester:

_____

7 Please indicate approximately how many hours per week you spend on teaching and preparation related activities during the semester:

_____

SECTION 2

PLEASE TICK THE APPROPRIATE CATEGORY.

'Electronic journals' are similar in nature to 'paper-based' journals and may contain features paper journals are not able to (such as hyper-text links, video, etc), but are **exclusively** delivered to you through an electronic medium, such as the Internet. Electronic versions of *The Harvard Business Review* or *New Scientist* etc are examples, but I am interested in your usage of the electronic versions only. NB: journals available as both electronic and paper versions are included in this definition.

Please take as much room as you need for your answers

8 How would you classify your experience using electronic networks, such as the Internet?

☐ Beginner

☐ Intermediate

☐ Intermediate to Advanced

☐ Advanced

☐ Other (Please specify)

_____

Any Comments? _____

_____

9 Have you attended an Internet training course?

☐ Yes (How long ago?)_____

☐ No

Comments?_____

_____

10 Do you personally subscribe (free or paid) to any academic electronic journals?

☐ Yes (How many?) _____ (Please give an example)_____

_____

☐ No

Why/Why Not _____

_____

_____

11 Would you

☐ ONLY read articles on-screen from academic electronic journals?

☐ ONLY print out interesting articles and then read them?

☐ Read articles on screen AND make copies to read later or to keep.

☐ Other (please specify)

_____

Comments? _____

_____

_____

12 Have you cited articles from academic electronic journals in your own work?

☐ Yes

☐ No

Why/Why not _____

_____

13 Would you cite articles from academic electronic journals in the future?

☐ Yes

☐ No

☐ Depends (please specify)_____

_____

_____

_____

14 In the years 1994-1998 have you submitted articles to scholarly, paper-based, journals?

☐ Yes (Approx. how many) _____

☐ No

Why/Why Not _____

_____

_____

15 In the years 1994-1998 have you submitted articles to scholarly electronic journals?

☐ Yes (Approx. how many?)_____

☐ No

Why/Why Not_____

_____

_____

16 Are you aware of any of your own articles being cited in an article in an academic electronic journal?

☐ Yes

☐ No

Comments? _____

_____

_____

_____

17 At present, do you intend to submit your own work for publication in academic electronic journals in the future?

☐ Yes
☐ No
☐ Depends (Please specify)_____

_____

_____

SECTION 3

This section of the survey seeks your attitudes towards electronic journals.

Please tick the appropriate category which most nearly reflects your ATTITUDE to the following statements.

18 I believe it is easier to subscribe to academic electronic journals than academic paper-based journals

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

19 I obtain information I need quickly using academic electronic journals

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

20 I am willing to publish my own research in academic electronic journals

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

_____

21 I believe publishing in paper journals has more academic status than publishing in electronic journals

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

22 I believe the publication of articles in academic electronic journals is much faster than academic paper-based journals (the time it takes from submission to the publication)

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

23 I prefer academic electronic journals because there is no wastage of paper.

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

24 I find using academic electronic journals is more convenient than paper-based journals

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

25 I believe most academic electronic journals have poor or inconsistent quality of articles

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

26 Academic electronic journal articles must be refereed for me to take them seriously

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

27 I am concerned about archival and historical access for academic electronic journal articles

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

28 I cannot be completely sure that any article appearing in an academic electronic journal has not been altered since being posted

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree
Comments? _____

_____

_____

29 Publishing in academic electronic journals does not contribute to promotion or tenure

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree

Comments? _____

_____

_____

30 Academic electronic journals are less stable than paper journals (may start then cease suddenly)

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree

Comments? _____

_____

_____

31 I believe eye strain from reading electronic journal articles is an important issue

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree

Comments? _____

_____

_____

32 I believe there is less chance for accidentally finding useful journal articles when using academic electronic journals

☐ Strongly Agree
☐ Agree
☐ Neutral/ No Opinion
☐ Disagree
☐ Strongly Disagree

Comments? _____

_____

_____

SECTION 4

This section of the survey seeks to discover your usage patterns of electronic journals.

Please tick the appropriate category, which most nearly reflects your USAGE of scholarly electronic journals.

33 I read academic electronic journals

☐ Always
☐ Usually
☐ Some of the time
☐ Rarely
☐ Never

Comments?_____

_____

34 I search academic electronic journals when researching a new topic

☐ Always
☐ Usually
☐ Some of the time
☐ Rarely
☐ Never

Comments?_____

_____

35 I read academic electronic journals to keep in touch with topics associated with areas in which I teach &/or have qualifications

- ☐ Always
- ☐ Usually
- ☐ Some of the time
- ☐ Rarely
- ☐ Never

Comments?_____

_____

36 I read academic electronic journals when I am at work (at ECU)

- ☐ Always
- ☐ Usually
- ☐ Some of the time
- ☐ Rarely
- ☐ Never

Comments?_____

_____

37 I read academic electronic journals at home

- ☐ Always
- ☐ Usually
- ☐ Some of the time
- ☐ Rarely
- ☐ Never

Comments?_____

_____

38 I make printouts of articles I am interested in

- ☐ Always
- ☐ Usually
- ☐ Some of the time
- ☐ Rarely
- ☐ Never

Comments?_____

_____

39 If I found an interesting article I would send a copy to a colleague, whom I believed would also find it interesting

- ☐ Always
- ☐ Usually
- ☐ Some of the time
- ☐ Rarely
- ☐ Never

Comments?_____

_____

40 If I found an interesting article I would notify a colleague whom I believed would also find it interesting

- ☐ Always
- ☐ Usually
- ☐ Some of the time
- ☐ Rarely
- ☐ Never

Comments?_____

_____

Do you have any other comments on Electronic Journals in general, or on their possible use at ECU?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Please put this response in the enclosed envelope. Thank you.

APPENDIX C

FINAL SURVEY – SECOND LETTER

STOP

5 -10 MINUTES OF YOUR TIME IS NEEDED

Dear Academic,

Last year you were included in a random sample of academics at ECU who were chosen to provide concrete information on the attitude of all academic staff towards Electronic Journals. You did not reply last time, but I am hoping you might be able to take a few minutes out of your busy schedule to respond.

This research will provide important information that may impact on academic libraries decisions whether or not to include electronic journals in their collections. There are many important questions that need to be researched and answered about electronic journals before libraries commit themselves irrevocably to changing collection policies.

Your participation in this survey is important. While this area has seen many opinions and theories being stated, there has been little research conducted.

This is an anonymous questionnaire. As the researcher, I do not have access to anyone's name or address. The list of random names has been kept separately from the responses and will be destroyed after this mail out. Please ensure that you do not write your name, or any other comments that will make you identifiable, on the attached. By completing the questionnaire you are consenting to take part in this research. **I guarantee that your response will be confidential.** No information will be used in any way so that any individual person could be identified.

PLEASE use the enclosed envelope and complete the survey as soon as possible. Please take the five to ten minutes to fill in this survey.

Any questions concerning the project entitled "Factors influencing academics usage of electronic journals" can be directed to **Margaret Krikorian** (Principal Investigator) on (0X) XXXX-XXXX[124]; or my supervisor **Karen Anderson** (School of Computer & Information Science) on (08) 9370-XXXX[124].

Thank you in advance for your co-operation with this survey.

Margaret Krikorian.
e-mail XXX[124]

[124] deleted for privacy